

AL.2.2002-173

NO ILL

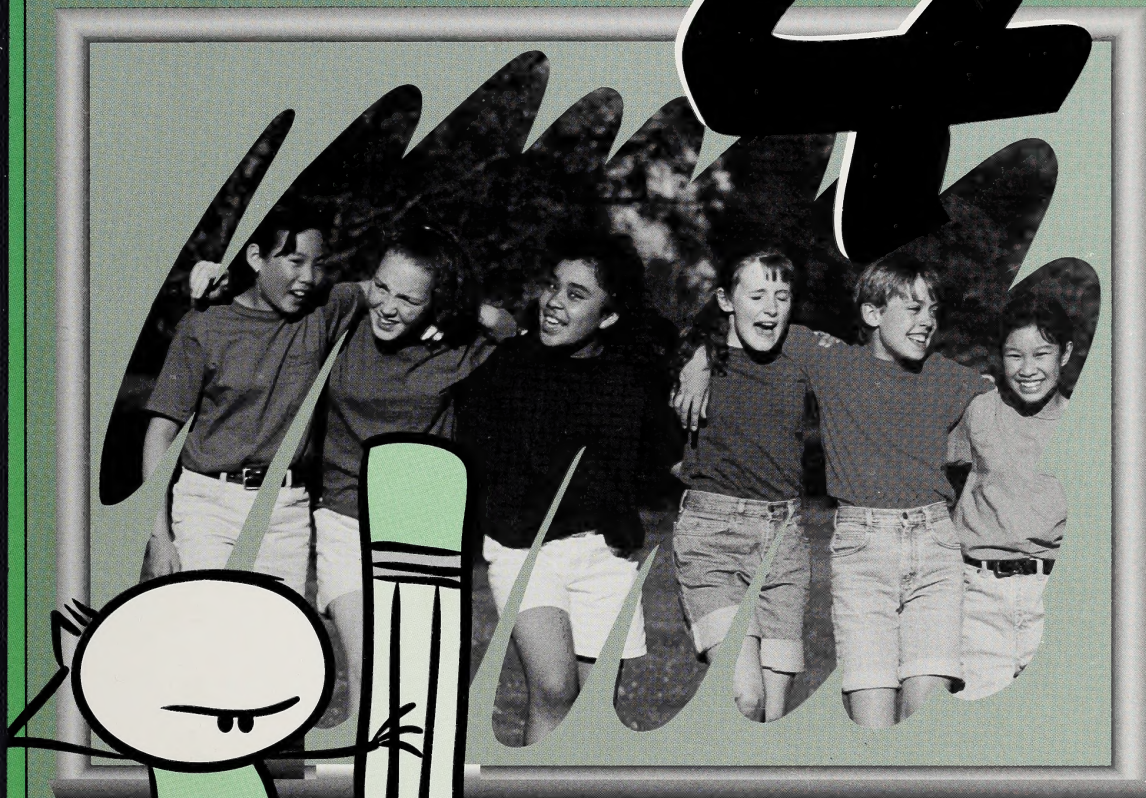
University of Alberta Library



0 1620 3452396 7

Mathematics

Module 6




Division



Learning
Technologies
Branch

Alberta
LEARNING

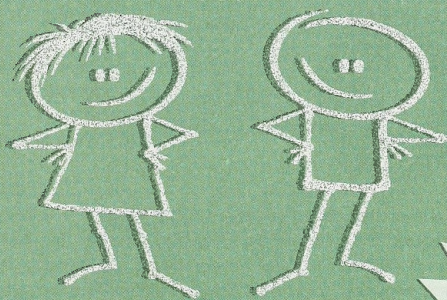


Digitized by the Internet Archive
in 2016 with funding from
University of Alberta Libraries

<https://archive.org/details/mathematics406albe>

Mathematics 4

Module 6 Division



Note
A page
providing
information for the
home instructor is
included in this
module.



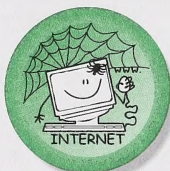
Learning
Technologies
Branch

Alberta
LEARNING

Mathematics 4
Module 6: Division
Student Module Booklet
Learning Technologies Branch
ISBN 0-7741-1818-0

Cover Photo: Nova Development Corporation

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	



The Learning Technologies Branch has an Internet site that you may find useful. The address is as follows:

<http://www.learning.gov.ab.ca/lrb>

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ALL RIGHTS RESERVED

Copyright © 2000, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2. All rights reserved. Additional copies may be obtained from the Learning Resources Distributing Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Learning.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.



Welcome!

Mathematics 4 contains nine modules. Work through the modules in the order given, since several concepts build on each other as you progress through the course.

Mathematics 4

Module 1

Data
Management

Module 2

Number Concepts
and Patterns

Module 3

Fractions
and Decimals

Module 4

Addition
and Subtraction

Module 5

Multiplication

Module 6

Division

Module 7

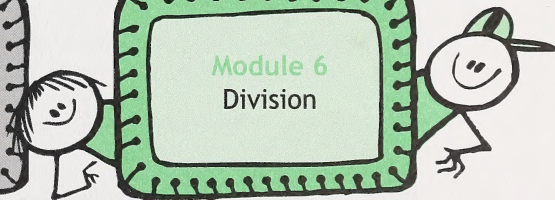
Measurement

Module 8

Exploring
Geometry

Module 9

Investigating
Outcomes



Icons



The book you are presently reading is called a Student Module Booklet. You will find icons used throughout it. Read the following explanations to find out what each icon tells you to do.



Pay close attention to important words or ideas.



Refer to the textbook
Quest 2000: Exploring Mathematics.



Use manipulatives, cut-out learning aids, or pull-out pages.



Do an activity to review the concept.



Use a calculator.



Prepare to do a Challenge activity.



Do an activity just for fun!



Do an activity with your home instructor.



Use the Internet.



Use the Answer Key to Self-Marking Activities in the Appendix to correct activities.



Use of Manipulatives and Cut-Out Learning Aids

In Module 6 students will be required to use a variety of manipulatives and cut-out learning aids.

Base Ten Blocks

Base ten blocks are used extensively in Module 6 to help the student understand the concept of division and to see what is happening when he or she divides. They can be used to help the student visualize a large number of objects being shared or grouped equally. They are also used to show why regrouping may be necessary when dividing larger numbers. Cut-out base ten blocks are provided in the Cut-Out Learning Aids section in the Appendix, but you are strongly urged to use real base ten blocks if possible.

Counters

Students will need access to several types of small counters that can be manipulated easily on a desk or tabletop. The Student Module Booklet gives several suggestions for counters, and more are included here:

- marbles
- paper clips
- dry beans
- small building blocks
- buttons
- pennies
- pieces of cereal
- nuts, bolts, or screws

Basic Multiplication Facts Table

The cut-out learning aids section of the Appendix includes a table of basic multiplication facts to 81. It is important that the student be familiar with the correct way to use this table. The factors are located on the side and top edges of the grid, while the products (answers) are found within the central squares.

To find the product of 5 and 8, find the number 5 along the left edge of the table. Then find the number 8 along the top edge of the table. If you trace down from the 8 and across from the 5, you will arrive at the number 40 on the table. This is the product of 5 and 8 ($5 \times 8 = 40$). Alternatively, finding 5 along the top edge and 8 along the left edge would result in the same answer.

The multiplication facts table is also used to check the solutions to division problems. When used this way, it contains the dividend (total) in the centre and the divisor and quotient along the top and left edges of the table.

Basic Division Fact Cards

The basic division fact cards in the Appendix can be used to drill the student on the division facts every day. For variety, you can choose different facts to review each day. For example, one day you might choose to use only the facts that are causing the student difficulty. On other days, you might choose only facts that are divisible by 4, 5, or so on. For further practice, you might make a 15-question quiz using the division facts you practised that day.

Hundred Counting Chart

The hundred counting chart is included in the Appendix to assist those students who are having difficulty with the repeated subtraction method taught in this module. Counters may also help with the repeated subtraction method.

Calculator

Students will occasionally be required to use a calculator for some activities in Module 6.



Information for the Student

The Grade 4 Mathematics course is designed to keep you actively involved in learning as you progress through the daily lessons in each of the nine modules. Besides the Student Module Booklets, you will also need a copy of the Grade 4 Mathematics textbook called *Quest 2000: Exploring Mathematics*. The textbook contains pictures, information, questions, and problems that are referred to in the modules. Each module also requires you to complete one or more Assignment Booklets to be sent to your teacher for marking.

Manipulatives

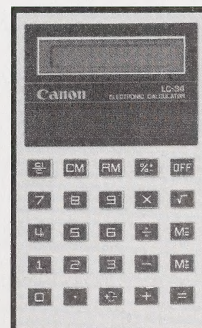
Manipulatives are hands-on materials that you will be using to help you learn new concepts and ideas. They include things like base ten blocks, geoboards, spinners, counters, polygon shapes, tiles, rulers, and metre-sticks. Don't worry if you don't have all of these manipulatives. Some can be found in the Cut-Out Learning Aids section of the Appendix in several of the modules. Some you may be asked to make from materials found in your own home. However, it is highly recommended that you have a set of base ten blocks. They will be used often to help you to understand many new math concepts.



You should use manipulatives whenever you think they will help you understand something new you are learning. Manipulatives can also be useful when you are sharing or discussing what you know with your home instructor.

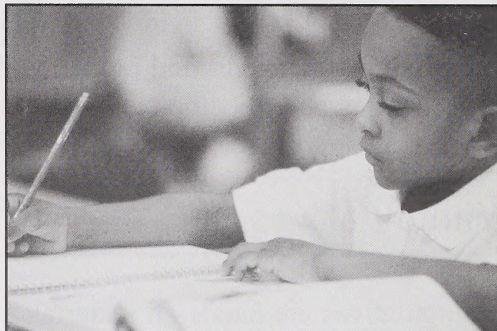
Calculators

You will need a calculator for many of the activities in Mathematics 4. It is important to remember that a calculator is a tool to be used when doing difficult calculations and when investigating what numbers can do. Don't rely on the calculator for calculations that you can do in your head. For example, you would not use a calculator when estimating or doing mental math. Both of these activities rely upon mastering the basic number facts.



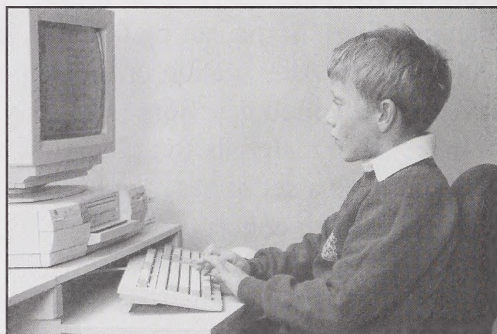
Basic Number Facts

You will practise the basic facts on several days of each module. Each drill is timed to encourage you to work quickly. At first, you may not do very well because you may not know all of the number facts yet, or you may have forgotten some of the number facts you learned last year. Don't worry. By practising the facts regularly, your scores will improve over time. Strategies to help you learn the number facts will be presented in the lessons.



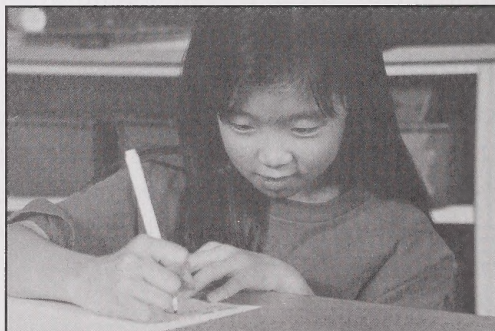
Computers

If you have your own computer at home, you may already know some computer software programs that help you to learn mathematics. There are also many websites on the Internet that provide math activities for students to do. Throughout this course, you will find optional activities that refer to software programs and Internet websites. You should do these activities only when you have finished the daily assigned work. **Note:** Always check with your home instructor before you log onto the Internet. **Remember that any Internet website address given in this module is subject to change.**



Journal Writing

In each Assignment Booklet, you will often be asked to complete a journal entry about something you have been learning in the module. Being able to put into your own words what you have learned is an important skill. It will help you think about what you know as well as help your teacher understand your thinking.

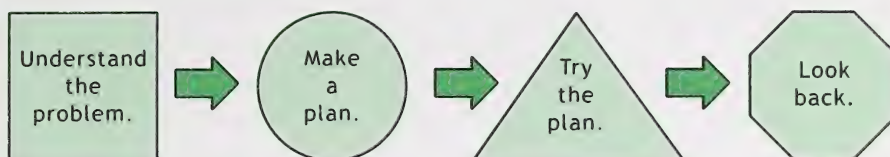




Problem-Solving Skills

You are already familiar with problem solving from earlier grades. This course will continue to help you develop strategies to make you a better problem solver. There are four steps that can be used to solve most problems.

The Four-Step Process



Step 1

Understand
the
problem.

In this step, you need to spend time reading over the problem in order to understand what you are being asked to find. One way to see if you understand the problem is to cover it up and then try restating it in your own words. Sometimes it might seem like not enough information is given. If this happens, try asking yourself the question, “What do I already know that will help me solve this problem?”

Step 2

Make
a
plan.

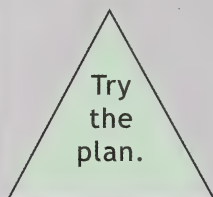
In this step, you decide on the method or strategy you will use to solve the problem. Different problems require different strategies. Most problems can be solved in more than one way. In this course, you will be looking at the following seven strategies:

- acting out the problem
- guessing and checking
- making an organized list
- drawing a diagram
- making a table or chart
- looking for a pattern
- making it simpler

You will be introduced to these strategies as you move through the modules. However, you may review each of the strategies at any time by turning to the Appendix of Module 1.

Remember, there is no one “right” way to solve a problem. The method or strategy you use may be different than the one your home instructor or someone else doing the problem would use. Sometimes you will find that more than one strategy on the list can be used to solve a problem. In fact, sometimes you may decide to invent a strategy of your own that is not even on the list.

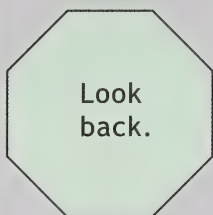
Step 3



In this step, you try out one of your strategies to see if it works to solve the problem. Don't worry if you can't find the answer immediately. Some problems take more than one step. You may also find it necessary to use your calculator to do some of the calculations.

Sometimes, as you try to solve the problem, you'll find that your strategy isn't working. Don't give up. Try another method instead.

Step 4



In this step, you take time to look at your answer and ask, "Is my answer reasonable? Does it make sense?" Writing your answer in a complete sentence may help you to see if, in fact, you have answered the question. If not, you may have to check your calculation for errors or, perhaps, try another strategy.

This is also a good time to look at the strategy you used and to think about how you could use it again in other problem-solving situations. Take time to share your strategies with your home instructor, and compare your method with the strategy your home instructor might use.



Remember, problem solving is a skill you need and will use throughout your life. The more practice you have with solving problems, the better your problem-solving skills become. Problems don't always have just one "right" answer. Some problems have several possible answers, just as some problems may be solved in several different ways.

Module Overview	1
------------------------------	----------

Section 1: Understanding Division

Day 1: What Does Division Mean?	4
Day 2: Another Way to Look at Division	14
Day 3: Reviewing the Basic Division Facts	22
Day 4: Multiplication and Division Are Related	29
Day 5: Stepping Into Division	39
Day 6: Problem Solving	49
Day 7: What About the Leftovers?	60
Day 8: Putting It All Together (I)	69
Day 9: Assessing What You Know (I)	71

Send in Assignment Booklet 6A.

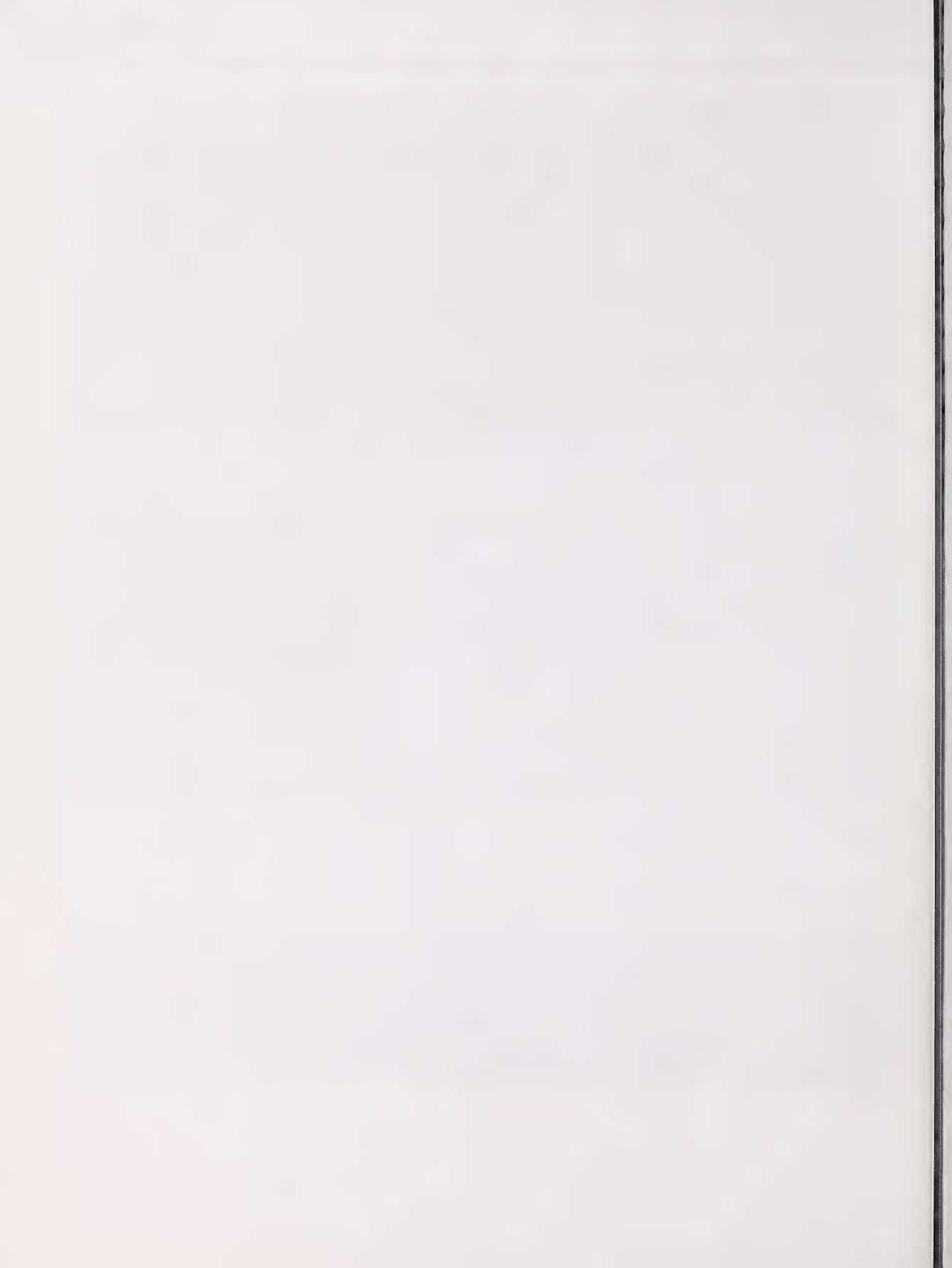
Section 2: Extending Your Division Skills

Day 10: Working with Remainders	76
Day 11: Checking the Answer	93
Day 12: Deciding Which Operation to Use	104
Day 13: Division in Three Steps	115
Day 14: Dividing Money Amounts.....	126
Day 15: Division in Four Steps	137
Day 16: More Ways to Check Quotients	154
Day 17: Putting It All Together (II)	164
Day 18: Assessing What You Know (II)	166

Send in Assignment Booklet 6B.

Appendix

Glossary.....	170
Answer Key to Self-Marking Activities	171
Image Credits	209
Cut-Out Learning Aids	
Number Facts Progress Chart for Module 6	



Overview

Module 6: Division

Section 1:
Understanding Division

Section 2:
Extending Your Division Skills

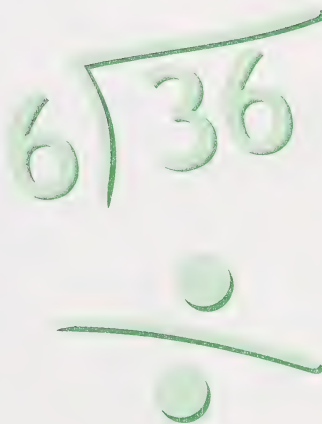


Module 6: Division

Have you ever shared candies with your friends? Did you try to make sure that everyone got the same number of candies? If you did, then you were dividing.

In this module you will

- learn what division is
- find ways to divide quickly
- use multiplication to help you divide
- think about division in different ways
- practise the basic division facts
- make your own division problems
- learn how to check your answers
- use estimation to find answers
- practise mental math skills
- learn a problem-solving strategy



There are **two** Assignment Booklets for Module 6.

You should send in Assignment Booklet 6A after completing Day 9.

You should send in Assignment Booklet 6B after completing Day 18.



Section 1

Understanding Division





What Does Division Mean?



Can you remember a time when you shared something with a friend or family member and you had to make sure that each of you got the same amount?

Have you ever organized large groups of objects into smaller groups with the same number of objects in each group?

In both cases, you were dividing.

Division is sharing a group of things equally with others.

Division is also making small groups from a larger number of items.

Today you will take a closer look at the way **division** works. This may be a review for you. If so, you should be able to complete the questions and assignments quickly. You will also look at easy ways to remember the basic number facts.

For the activities in Day 1, you will need at least 50 small objects that are similar. With the help of your home instructor, find at least 50 objects like the tabs from pop cans, bread bag clips, dry macaroni, pennies, or beads. Make sure that the objects are small enough to be grouped easily on your desktop or tabletop. You will use these items as counters to help you with division.

Division Is Sharing

You can look at division in two different ways:

sharing or **grouping**

In Day 1 you will learn about division as sharing. Division is a way of **sharing** things equally.

Example

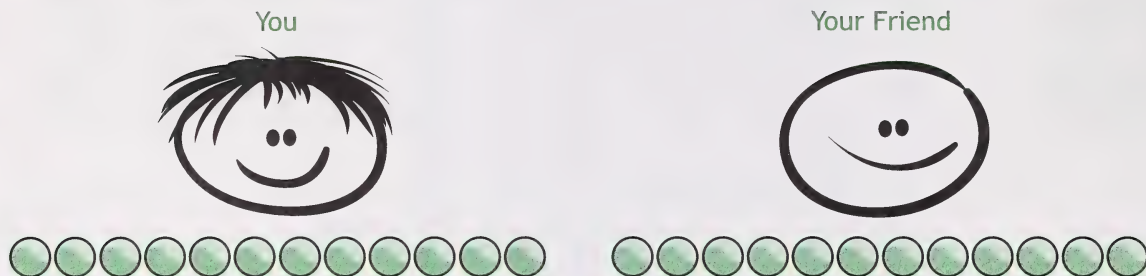
You have a bag of marbles to share with one friend. You know there are 24 marbles in the bag. How would you share them so that each of you has the same number?



This problem asks you to share with one other person. Use your counters to solve the problem.

Place 24 counters on your desk. Show that you are sharing them equally with one friend.

“Deal out” the counters to yourself and your friend one at a time until they are all used up. When you are done, you should each have the same number of counters.



Sharing 24 marbles equally between two people results in 12 marbles for each person. The division sentence to show this sharing is $24 \div 2 = 12$.

$$\begin{array}{ccccc} \text{Total number of} & \longrightarrow & \mathbf{24 \div 2 = 12} & \longleftarrow & \text{Number of marbles} \\ \text{marbles} & & & & \text{per person} \\ & \nearrow & & \nwarrow & \\ & \text{This sign means} & & \text{Number of} & \\ & \text{"divided by."} & & \text{people sharing} & \end{array}$$

The division sentence is read “**24 divided by 2 equals 12.**”

The sentence answer to the problem could be written as follows:

Each person should be given 12 marbles.



Try another sharing problem. Once again, you will need 24 counters.

1. Now another friend has come to play and you must share 24 marbles among 3 people (yourself and two friends). Use your counters to show how you would share 24 marbles among 3 friends. Draw a picture of your results.

2. Write the division sentence that shows the solution to the problem.

3. Complete the sentence answer.

Each person will receive _____.



Check your answers in the Appendix.



4. What if one more friend noticed you were sharing your marbles and wanted some as well? You must now share 24 marbles among 4 people. Use your counters to show how you would share your marbles. Draw a picture showing how you would solve the problem.

5. Write a division sentence that shows the solution to the problem.
-

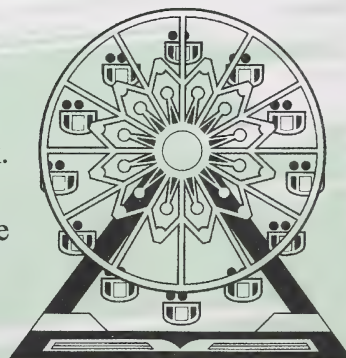
6. Complete the sentence answer.

Each person will receive _____.

Check your answers in the Appendix.

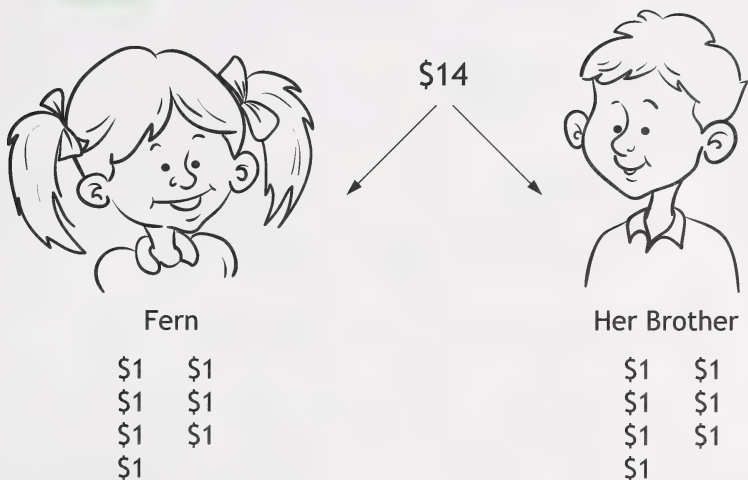
Example

Fern's parents gave money to Fern and her brother to use at the amusement park. They had \$14 to share equally. How much money would each of them be able to spend at the park?



How would you solve this problem?

$$\$14 \div 2 =$$



$$\$14 \div 2 = \$7$$

Fern and her brother would each be able to spend \$7.



Now it's your turn to write a division problem!

7. a. Write a sharing problem that might happen to you or to people you know. Use the following division sentence to help you.

$$21 \div 3 =$$



Remember: The first number in the division sentence (21) stands for the total number of items being shared. The 3 stands for the number of people or groups sharing the items.

Use one of these ideas if you like.

- 21 pizza pieces shared by 3 friends
- 21 hockey cards shared by 3 children
- \$21 prize money split between 3 sisters and brothers

Reminder! Does your story problem end with a question? Make sure that the question asks how many “things” each person will get after the sharing has taken place.

b. Solution: $21 \div 3 =$ _____

c. Draw a sketch of your solution.

d. Sentence answer: _____

Check your answers in the Appendix.



8. a. Now try writing another division story problem.

Use ideas from the Writing Bank below to write a sharing problem using the division sentence.

$$45 \div 9 =$$

Writing Bank	
Pennies	Children at a carnival
Glasses of pop	Teenagers at a party
CDs	Music lovers
Video games	Computer users
Apples	People at a picnic
Spruce trees	New homeowners
New chairs	Classrooms

Reminder: Does your problem end with a question?

b. Solution: $45 \div 9 =$ _____

c. Draw a sketch of your solution.

d. Sentence answer: _____

Check your answers in the Appendix.

Share your story problem with your home instructor.

There are many real-life examples of problems that involve sharing. In your life, you may be asked to share food, toys, or money. You will need to know how to divide these items so that equal amounts are created.

Turn to Assignment Booklet 6A, and complete the activities for Day 1.





Another Way to Look at Division

In Day 1 you learned that division is a way of sharing a group of items equally between people or things.

Division is also making small groups from a larger number of items.



Dividing Is Making Equal Groups

Suppose you are in charge of making floor hockey teams in your local league. There are 30 players to be put on teams. Each team is to have 6 players. How many teams can be made?

To solve this kind of problem, make smaller groups out of the larger group.



Use your counters to work through this problem.

Take out 30 counters. Make five groups of six counters to show that each team has six players.



You should end up with five floor hockey teams with six players on each team.

The division sentence to show this grouping is $30 \div 6 = 5$.

Total number of players \longrightarrow $30 \div 6 = 5$ \longleftarrow Number of groups

Number in each group

The division sentence is read “**30 divided by 6 equals 5.**”

The sentence answer to the problem could be written as follows:

Five floor hockey teams can be made.





1. a. This time, 35 basketball players are being put onto teams. Each team is to have 5 players. How many teams can be made?

Use your counters to make groups of five. Draw a picture of your solution in the space provided.

- b. Write the division sentence that describes the problem.

- c. Sentence answer: _____



Check your answers in the Appendix.



2. a. What if 30 basketball players had to travel to a basketball game in vans? If each van holds 10 players, how many vans are needed?

Use your counters to solve this problem. Make groups of ten. Draw a sketch of your counters.

- b. Write the division sentence that describes this problem.

- c. Sentence answer: _____

Check your answers in the Appendix.

Now, it's your turn to write a division story problem that involves grouping.

Remember: A grouping problem should tell about a large group of items being divided into smaller groups of equal size.

3. a. Write a simple story problem about this division sentence.

$$56 \div 8 =$$

Fill in the blanks using the words in the box.



collector cards

album

Calvin was sorting out his _____. He decided to put the 56 cards into groups of 8 so that they would fit into the pages of his card collector's _____. How many pages will he need?

- b. Solution: $56 \div 8 =$ _____

Draw a sketch of your solution here. Make groups of eight.

- c. Sentence answer:

Check your answers in the Appendix.



4. a. Use ideas from the Writing Bank to write a division problem that shows 48 items being put into groups of six.

$$48 \div 6 =$$

Writing Bank

Eggs	Egg cartons
Pages of paper	Booklets of paper pages
Muffins	Packages of muffins
Chocolates	Gift boxes
Chairs	Rows for a concert
Straw bales	Stalls for horses
Photographs	Album pages
Hockey pucks	Practice games of hockey
Balloons	Party packages

Reminder: Does your problem end with a question?

b. Solution: $48 \div 6 =$ _____

Draw the solution.

c. Sentence answer: _____



Check your answers in the Appendix.

Share your story problem with your home instructor.



Note to the Home Instructor

For extra practice and review of basic division facts, the student may want to visit the following websites:

- <http://www.aplusmath.com/Games/index.html>

The student will need to select those activities requiring division skills.

- <http://explorer.scrtec.org/explorer>

The student may need assistance in locating those activities requiring division skills.



5. Answer the following division “grouping” problems.

a. 54 chickens \div groups of 9 chickens = _____ coops of chickens

b. 49 train cars \div groups of 7 cars = _____ trains

c. 28 books \div groups of 4 books = _____ cartons of books

d. 35 players \div groups of 7 players = _____ teams



Check your answers in the Appendix.

Turn to Assignment Booklet 6A, and complete the activities for Day 2.





Reviewing the Basic Division Facts



In earlier modules you practised the basic number facts for addition, subtraction, **multiplication**, and division. Today you will review the basic **division** facts. You will use flash cards to help you recall these facts easily.



Several pages of division cards can be found in the Appendix. Cut out the individual cards. Keep all of your division cards in an envelope or a plastic bag.

Try these different ways of practising your division facts:

- Spend time each day working on the division flash cards.
- Sort the cards different ways when you work on them.
 - Sometimes pick out the cards that you find most difficult to remember and work only on those.
 - Practise with a new set each day. On one day, work only on the " $\div 3$ " flash cards. On the next day, work only on the " $\div 7$ " flash cards.
 - On other days, use the entire set of cards.
- Ask a friend, brother, sister, or your home instructor to do flash card drills with you each day. Do them as quickly as you can.
- Try to think of other ways to sort your cards so that you don't have to practise all of them at once. Ask your home instructor to help.



Find your “ $\div 3$ ” flash cards now. Lay them out on your desk and try to recall the answers to the cards from memory. Check the answer on the back of each card. Do this for 3 or 4 minutes. Then do the following activity.

1. Complete the following questions **without** looking at your flash cards!

a. $15 \div 3 =$ _____

b. $18 \div 3 =$ _____

c. $21 \div 3 =$ _____

d. $12 \div 3 =$ _____

e. $9 \div 3 =$ _____

f. $30 \div 3 =$ _____

g. $27 \div 3 =$ _____

h. $24 \div 3 =$ _____

i. $12 \div 3 =$ _____

j. $6 \div 3 =$ _____

k. $18 \div 3 =$ _____

l. $21 \div 3 =$ _____

m. $18 \div 3 =$ _____

n. $9 \div 3 =$ _____

o. $27 \div 3 =$ _____

Check your answers in the Appendix.



You can repeat this activity many times by using a different set of cards each time. Use the “ $\div 4$ ” cards one day, the “ $\div 5$ ” cards the next day, and so on.



Now try another way of sorting and studying the division facts flash cards. Find all the division fact cards that have an answer of 4. Lay these cards out on your desk.

$8 \div 2 =$

$12 \div 3 =$

$16 \div 4 =$

$20 \div 5 =$

$24 \div 6 =$

$28 \div 7 =$

$32 \div 8 =$

$36 \div 9 =$

Study all eight cards. Turn them over and then try to say all eight division sentences that give you an answer of 4. Practise this for 3 or 4 minutes. Then do the following activity.



2. Place **all** 64 division fact cards on your desktop. Mix them up well. Ask your home instructor to time you as you quickly pick out the eight cards that have an answer of 4.

How many cards did you find? _____

How long did it take? _____ seconds

Put **all** your division fact cards back on your desktop. Move all the cards around so that they are well mixed before you try each of the following exercises.

3. See how quickly you can pick out all the cards that have an answer of 2.

How many cards did you find? _____

How long did it take? _____ seconds

4. See how quickly you can pick out all the cards that have an answer of 3.

How many cards did you find? _____

How long did it take? _____ seconds

5. See how quickly you can pick out all the cards that have an answer of 6.

How many cards did you find? _____

How long did it take? _____ seconds

Practise this activity
often to improve your time!



Check your answers in the Appendix.

There are many ways to practise the division facts. **It is important to practise them often so that you can recall them quickly and accurately.** Knowing the facts will make your job much easier when you are asked to solve more difficult problems.

If you already think you know the division facts and can recall them quickly and correctly, the lesson for today will have been a review for you. If so, try working faster on the timed tests at the end of the lesson. You might want to try doing the timed exercises in 1 minute rather than 2 minutes.



Basic Number Facts Practice



Turn to the Number Facts Progress Chart for Module 6 in the Appendix. Remove the chart from the Appendix and hang it in your study area. You will use this chart to record your scores for the number facts drills in Module 6.

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

Basic Number Facts Practice

Division Number Facts

Number Completed in 2 Minutes _____


Number Correct in 2 Minutes _____

Multiplication Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Record your score on the Number Facts Progress Chart.



6. Division Number Facts

Timed Exercise: 2 minutes

$3 \overline{)12}$

$6 \overline{)42}$

$9 \overline{)36}$

$5 \overline{)25}$

$2 \overline{)10}$

$24 \div 6 =$

$30 \div 5 =$

$27 \div 3 =$

$32 \div 4 =$

$12 \div 4 =$

$4 \overline{)36}$

$2 \overline{)18}$

$5 \overline{)25}$

$8 \overline{)32}$

$3 \overline{)18}$

$27 \div 9 =$

$15 \div 5 =$

$35 \div 7 =$

$20 \div 5 =$

$24 \div 8 =$

$3 \overline{)21}$

$4 \overline{)32}$

$6 \overline{)36}$

$7 \overline{)14}$

$4 \overline{)28}$



Check your answers in the Appendix.



7. Multiplication Number Facts

Timed Exercise: 2 minutes

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$$

$7 \times 3 =$

$7 \times 1 =$

$8 \times 4 =$

$5 \times 3 =$

$5 \times 8 =$

$$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$$

$4 \times 9 =$

$8 \times 5 =$

$5 \times 5 =$

$3 \times 7 =$

$4 \times 4 =$

$$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$$

Check your answers in the Appendix.

Turn to Assignment Booklet 6A, and complete the activities for Day 3.



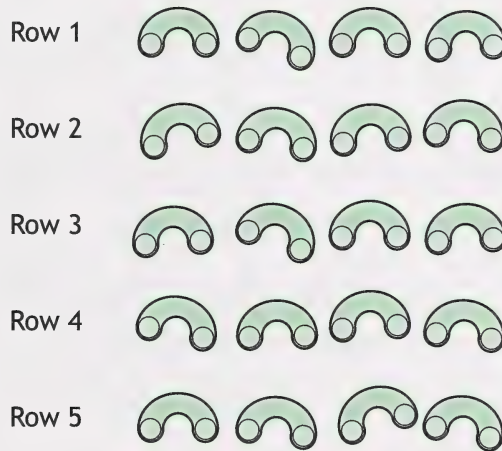


Multiplication and Division Are Related

In Module 5 you learned that multiplication can be shown by using an **array**. Today you will use arrays and the multiplication facts to help you think about division. An array is an arrangement of objects in rows and columns.

Use your counters to show 5×4 .

Make five rows with four counters in each row.



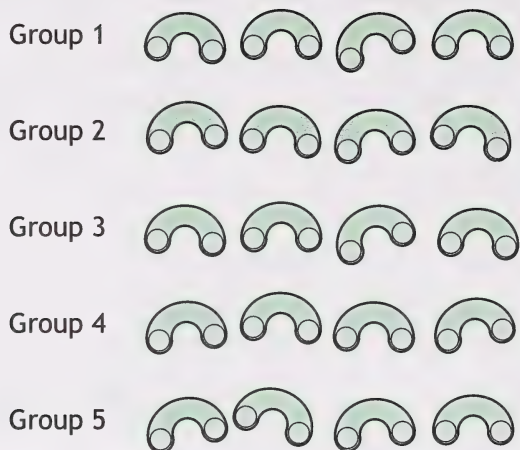
The **product** of 5×4 is 20. This is the total number of objects in the array.

When you do division, you are taking the total number of objects and dividing or splitting it into groups of the same size.

Now use your counters to show $20 \div 5$.

Take 20 counters and divide them into five groups.

Your array should look like this.



Did you notice that the division array showing $20 \div 5$ is the same as the multiplication array showing 5×4 ? You might also see that $20 \div 4$ and 4×5 can be shown with the same array.

1. Draw an array to show $20 \div 4 = 5$. (Show 20 divided into groups of five. Draw a circle around each group.)



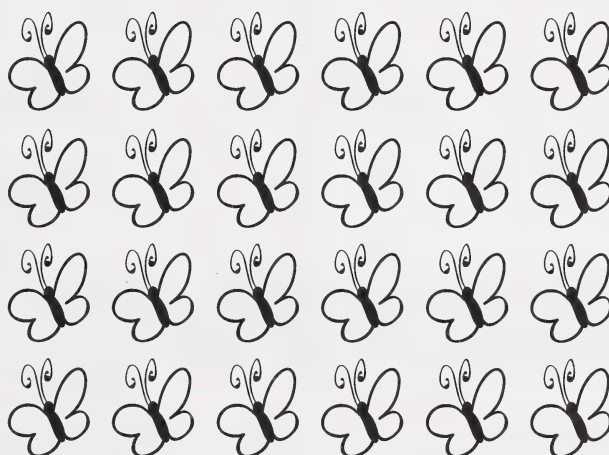
Check your answers in the Appendix.



Multiplication and division are related operations. Multiplication is the reverse operation of division. Division is the reverse operation of multiplication.

Knowing that multiplication and division are related is very helpful when learning the basic division facts.

For example, you can use the following array to write four **related sentences**—two multiplication sentences and two division sentences.



$$4 \times 6 = 24$$

$$24 \div 6 = 4$$

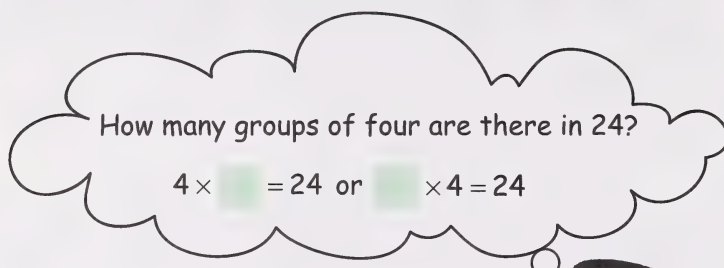
$$6 \times 4 = 24$$

$$24 \div 4 = 6$$

The array shows multiplication. There are four groups of six or six groups of four. The total (or product) is 24.

The array also shows division. The total of 24 can be divided into four groups of six or six groups of four.

If you have difficulty remembering that $24 \div 4 = 6$, try thinking about how many groups of four there are.

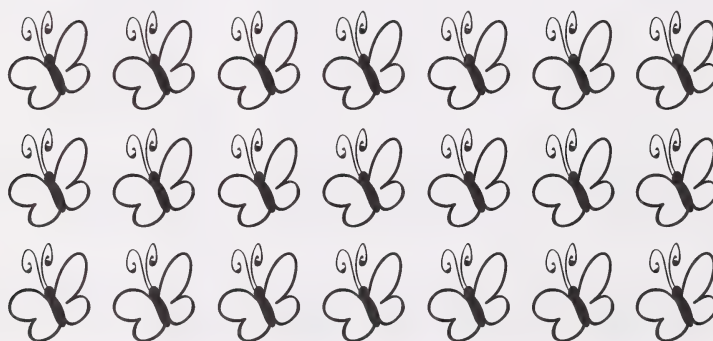


The answer is 6.



2. Write the **four** related sentences for the following array.

- _____
- _____
- _____
- _____



Check your answers in the Appendix.



3. a. Use your counters to show $32 \div 8 = 4$. Draw a picture of your counters in the space below.

- b. Write the **four** related sentences that are shown by your array.

- _____
- _____
- _____
- _____

Check your answers in the Appendix.

4. Write the missing related sentence that belongs in each set:

a. • $2 \times 8 = 16$

• $8 \times 2 = 16$

• $16 \div 8 = 2$

• _____

b. • $24 \div 3 = 8$

• $24 \div 8 = 3$

• $3 \times 8 = 24$

• _____

c. • $4 \times 3 = 12$

• $12 \div 3 = 4$

• $3 \times 4 = 12$

• _____

Check your answers in the Appendix.

Using the Multiplication Table to Divide

The multiplication table can help you learn the basic division facts. You can use the multiplication table because division and multiplication are related operations.



In Day 4 of the Cut-Out Learning Aids section of the Appendix, you will find a table listing all the multiplication facts that you have been memorizing in Mathematics 4. Look at the multiplication table now.

When you use the table to help you divide, start with the number you are dividing by.

Suppose you cannot remember the answer to $63 \div 7$. Find 7 along the top row of the table. Then follow the 7 column down until you reach 63. While holding your finger on 63 to mark its place, follow the row to the left until you come to the end of the row. The answer is 9.

$$63 \div 7 = 9$$

X	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

To help you find the answer to $63 \div 7$, you could also look for 7 along the left side of the table first, instead of on the top. Follow across the row until you reach 63. Then move your finger to the top of the column.

X	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

The answer is 9, the same as what you got the other way.

5. Use your multiplication table to solve the following division questions.

a. $45 \div 9 =$ _____

b. $36 \div 9 =$ _____

c. $42 \div 7 =$ _____

d. $54 \div 9 =$ _____

e. $81 \div 9 =$ _____

f. $32 \div 8 =$ _____

g. $27 \div 3 =$ _____

h. $64 \div 8 =$ _____

i. $72 \div 9 =$ _____

Check your answers in the Appendix.





Each number in a division sentence has a special name.

$$\begin{array}{c} \text{Dividend} \longrightarrow 27 \div 3 = 9 \longleftarrow \text{Quotient} \\ \uparrow \\ \text{Divisor} \end{array}$$

The **quotient** (pronounced “kwō -shent”) is the answer you get when you divide two numbers.

The **dividend** is the total number that you start with.

The **divisor** is the number you divide by.

$$\text{Dividend} \div \text{Divisor} = \text{Quotient}$$

Division sentences can also be written another way.

$$\begin{array}{c} \text{Divisor} \longrightarrow 3 \overline{)27} \longleftarrow \text{Quotient} \\ \uparrow \\ \text{Dividend} \end{array}$$

$$\begin{array}{r} \text{Quotient} \\ \text{Divisor} \overline{) \text{Dividend}} \end{array}$$

6. In these division sentences, circle the quotient.

a. $35 \div 5 = 7$

b. $72 \div 9 = 8$

c. $4 \overline{)28}^7$

7. In these division sentences, circle the divisor.

a. $42 \div 6 = 7$

b. $30 \div 5 = 6$

c. $8 \overline{)40}^5$

8. In these division sentences, circle the dividend.

a. $27 \div 9 = 3$

b. $5 \overline{)45}^9$

c. $7 \overline{)56}^8$

Check your answers in the Appendix.

Special Divisors: Dividing by 1

Remember that in multiplication, any number multiplied by 1 results in the number itself.

Example

$$7 \times 1 = 7$$

This is the same as saying 7 groups of 1 equals 7 objects in all.

$$1 \times 7 = 7$$

This is the same as saying 1 group of 7 objects equals 7 objects in all.

Notice that multiplying by 1 does not change the number you start with. The product (answer) is always the original number.

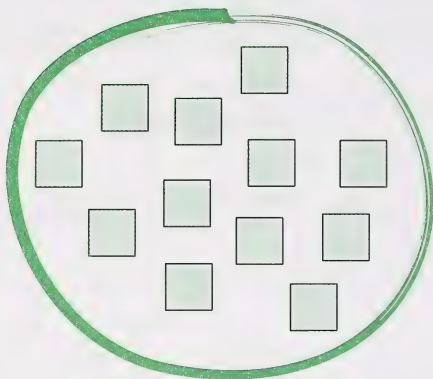
The number 1 is also special when it is used to divide other numbers.

Example

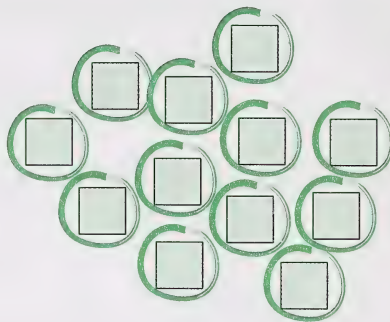
$$12 \div 1 =$$

This could mean

12 things divided into 1 group of 12 or 12 things put into 12 groups of 1



$$12 \div 1 = 12$$



$$12 \div 1 = 12$$

9. Solve the following division questions quickly in your head.

a. $4 \div 1 =$ _____

b. $6 \div 1 =$ _____

c. $42 \div 1 =$ _____

d. $28 \div 1 =$ _____

e. $56 \div 1 =$ _____

f. $389 \div 1 =$ _____

g. $277 \div 1 =$ _____

h. $999 \div 1 =$ _____

Check your answers in the Appendix.



Turn to Assignment Booklet 6A, and complete the activities for Day 4.





Stepping Into Division

Division Is Repeated Subtraction

Division can be thought of as **repeated subtraction**.

Example

$$36 \div 6 =$$

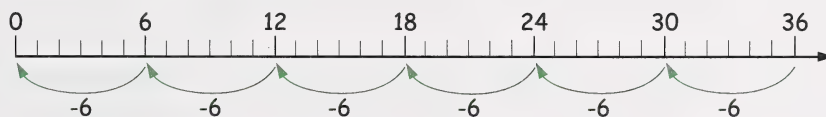


Place 36 counters on your desk. Take away six counters. Then take away another six counters. Continue taking away six counters at a time until there are none left.

How many times did you take away six counters? You should have counted six times.

$$36 \div 6 = 6$$

You can also see this on a number line.



You are actually stepping backward by six from 36. You take six steps backward before you arrive at zero.

$$36 - 6 - 6 - 6 - 6 - 6 - 6 = 0$$

$$36 \div 6 = 6$$

You can also think of repeated subtraction as going down steps.

$$36 - 6 = 30$$

$$30 - 6 = 24$$

$$24 - 6 = 18$$

$$18 - 6 = 12$$

$$12 - 6 = 6$$

$$6 - 6 = 0$$

You are stepping down from 36 to zero.
You are stepping down six each time.
You step down six times to reach zero.



Try another example with your counters.

Place 32 counters on your desk. Take away eight counters. Then take away another eight counters.

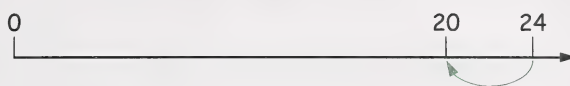
How many times did you take away eight counters before no counters were left? You should have said four times.

$$32 \div 8 = 4$$

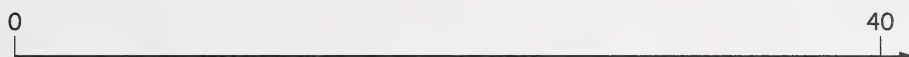
1. Show $32 \div 8$ on a number line. Use arrows to show your jumps. Jump backward by 8 until you reach zero. Try to make your jumps even. The first jump has been done for you.



2. Show $24 \div 4$ on this number line. Space your jumps of 4 evenly. The first jump has been done for you.



3. Show $40 \div 5$ on this number line.



Check your answers in the Appendix.

Division Is Skip Counting Backward

In Module 5 you practised skip counting to help you understand multiplication.

To skip count by 2 to 18 you would write

2, 4, 6, 8, 10, 12, 14, 16, 18

This is the same as multiplying 2 by 9.

$$9 \times 2 = 18$$

You counted 9 groups of 2 to reach 18.

You can also skip count to show division. The difference is that you count backward instead of forward.

To skip count backward by 2 from 18, you would write

18, 16, 14, 12, 10, 8, 6, 4, 2

This is the same as dividing 18 by 2.

$$18 \div 2 = 9$$

You counted backward by 2 from 18. You counted 9 numbers to reach the last group of two.

Skip counting backward is really another way to do repeated subtraction.



Turn to Day 5 of the Cut-Out Learning Aids section in the Appendix. Remove the One Hundred Counting Chart. Place the chart on your desktop. You also need your counters.

Lay out 28 counters in a line. Count backward by 4 from 28. As you count, move groups of 4 away from the main group of counters. If you have trouble counting backward by 4, use your counting chart.

28, 24, 20, 16, 12, 8, 4

How many groups of 4 did you remove?

You should have counted seven groups of 4.

$$28 \div 4 = 7$$

4. Complete the following questions by skip counting backward from the first number. Use your counting chart if you need to.

a. 45, 40, 35, _____, _____, _____, _____, _____

b. 27, 24, 21, _____, _____, _____, _____, _____

c. 54, 48, 42, _____, _____, _____, _____, _____

d. 18, 16, _____, _____, _____, 8, _____, _____, _____

e. 63, 56, _____, _____, 35, _____, 21, _____, _____

Check your answers in the Appendix.

The division sentence for question 4.a. would be $45 \div 5 = 9$.

You started with a total of 45. You counted backward by 5s. You counted nine groups of 5.

5. Complete the following patterns by skip counting backward from the first number. Then write the division sentence that matches the pattern.

a. 70, 60, 50, _____, _____, _____, _____

Division sentence: _____

b. 22, 20, 18, _____, _____, _____, _____, _____

_____, _____, _____

Division sentence: _____

c. 49, 42, 35, _____, _____, _____, _____

Division sentence: _____

Check your answers in the Appendix.

Writing Division Story Problems

6. Look at this fishing picture.



- a. Use the picture to write a story problem that tells about the division sentence $26 \div 2$. Name the people in your problem and be sure to end your problem with a question.

- b. Now solve the problem by using repeated subtraction or by skip counting backward. Show your work on a number line.

c. Division sentence: _____

Check your answers in the Appendix.

Mental Math



Zapping the Zeros

Mental math strategies help you figure out answers to math questions in your head. You don't use a pencil and paper or a calculator. You just find quick and easy ways to solve problems in your head.

Some problems may look difficult at first, but if you use a mental math strategy, they can be solved quite easily.

The Zapping the Zeros strategy can be used whenever the larger number (the dividend) ends with a zero and you are dividing by 10 or 100.

Example 1

$$390 \div 10 =$$

Since both numbers end in zero, you can zap the zeros. This means that you drop the final zero in each number.

$390 \div 10$ becomes $390 \div 10$ or $39 \div 1$.

Note: You can show your thinking by crossing out the zeros to be dropped.

Since you already know that dividing by 1 does not change the original number, the answer is 39.

$390 \div 10 = 39$

Example 2

$470 \div 10 =$

Zap the common zeros. $470 \div 10 =$

Divide by 1. $47 \div 1 = 47$

Therefore $470 \div 10 = 47$

7. Try the following questions on your own. Zap the zeros!

a. $590 \div 10 =$ _____

b. $240 \div 10 =$ _____

c. $940 \div 10 =$ _____

d. $310 \div 10 =$ _____

e. $10 \overline{)290}$

f. $10 \overline{)650}$

Check your answers in the Appendix.



Sometimes you may find that the numbers in a division question have an unequal number of zeros.

Example

$$4300 \div 10 =$$

Zap only the common zeros. This means that you can drop a zero only if **both** numbers have a zero. Notice that you can drop only one zero from each number in this example.

$$4300 \div 10 \text{ becomes } 430 \div 1 \text{ or } 430 \div 1.$$

The zero in 430 cannot be dropped since there is no matching zero in 1.

Divide by 1. $430 \div 1 = 430$

Therefore $4300 \div 10 = 430$

Note: You drop only one zero when dividing by 10 because 10 only has one zero.

8. Try the following questions.

a. $6800 \div 10 =$ _____

b. $2900 \div 10 =$ _____

c. $5500 \div 10 =$ _____

d. $10 \overline{)6300}$

Check your answers in the Appendix.



Dividing by 100

Zapping the zeros also works when you are dividing by 100.

Example

$$6200 \div 100 =$$

Zap the common zeros.

$$\mathbf{6200 \div 100 \text{ becomes } 62 \div 1.}$$

Drop two zeros because both 100 and 6200 have two zeros.

Divide by 1. $62 \div 1 = 62$

Therefore $6200 \div 100 = 62$

Zapping the common zeros when you divide by 100 is a short-cut method that allows you to solve problems.

9. Solve the following questions in your head.

a. $200 \div 10 =$ _____

b. $4800 \div 100 =$ _____

c. $7300 \div 100 =$ _____

d. $6900 \div 10 =$ _____

e. $3000 \div 10 =$ _____

f. $8000 \div 100 =$ _____

Check your answers in the Appendix.

Turn to Assignment Booklet 6A, and complete the activities for Day 5.





Problem Solving

In Module 1 you were introduced to the problem-solving process and to the four-step method of problem solving.

A description of the various problem-solving strategies introduced in Grade 4 can be found in the Problem-Solving section of the Appendix of Module 1. You may refer to this section at any time throughout the year if you need help learning to use any of the strategies.

Today you'll look at another problem-solving strategy.

Problem-Solving Strategy: Making a Table



One way to solve a problem involving lots of facts or numbers is to make a table to show the information. This method may make the problem easier to solve for several reasons:

- You can clearly see the information or numbers that you already have.
- You can see the information that you still need to find.
- Sometimes you will see a pattern of numbers forming as you put the data in a table.

Look at a problem that could be solved by making a table.



The Hendersons sell apples at the local Farmer's Market every week. Bags of 6 apples are sold for \$1.25 a bag. Today the Hendersons came home with \$6.25. How many apples did they sell?

Step 1: Understand the problem.

There are six apples in one bag. Each bag costs \$1.25. The total money collected is \$6.25. You need to find out how many apples were sold.

Step 2: Make a plan. (Choose a strategy.)

Since there are several numbers involved in this problem, use a strategy that will display all of the numbers. Use the Making a Table strategy.

Step 3: Try the plan.

Draw a simple table to record the numbers. The problem tells you that six apples cost \$1.25.

From there, you can calculate that two bags (or 12 apples) will cost two times as much.

$$\$1.25 + \$1.25 = \$2.50$$

Write this new information in the table.

Number of Apples	6	12			
Cost	\$1.25	\$2.50			

If you continue with the pattern, you can see that 18 apples cost \$1.25 more than 12 apples. Eighteen apples will cost \$3.75.

Another six apples would add \$1.25 to the cost. Twenty-four apples would cost $\$3.75 + \1.25 or \$5.00.

Number of Apples	6	12	18	24	?
Cost	\$1.25	\$2.50	\$3.75	\$5.00	\$6.25

You need to find out how many apples would cost \$6.25.

1.

ANSWER TO THE PROBLEM

_____ apples were sold if \$6.25 was collected by the end of the day.

Step 4: Look back.



Have you solved this problem? Does your answer make sense?

Check your answers in the Appendix.

If you were to continue the table, you would be able to find out how many apples were sold if \$10.00, \$15.00, or \$20.00 had been collected at the end of the day.

The table made it easy for you to see the information. It also made it easy to see patterns. The number of apples increased by 6 each time. The money increased by \$1.25 each time.

2. Continue the table to find out how many apples were sold if \$10.00 was collected by the end of the day.

Number of Apples	24				?
Cost	\$5.00				\$10.00

ANSWER TO THE PROBLEM

_____ apples were sold if \$10.00 was collected by the end of the day.



Check your answers in the Appendix.

3. Continue the table to find out how many apples were sold if \$25.00 was collected by the end of the day.

Number of Apples					?
Cost	\$10.00	\$20.00			\$25.00

ANSWER TO THE PROBLEM

_____ apples were sold if \$25.00 was collected by the end of the day.

Check your answers in the Appendix.



Other kinds of problems can be solved by using a table.

When you are asked to compare two events, it may be useful to record the information in a table.

Example



Jamie and Kim like to play ball together but don't often have the same schedule. Jamie plays ball every second afternoon after school. Kim plays every third afternoon after school. They will play together today. In the next ten days, how often will they play ball together?

Step 1: Understand the problem.

Jamie and Kim will play ball together a few times in the next ten days. How many times will they play together if Jamie plays every second day and Kim plays every third day?

Step 2: Make a plan. (Choose a strategy.)

Use the Making a Table strategy to compare Jamie's schedule to Kim's schedule.

Step 3: Try the plan.

The table will show three different kinds of information:

- days
- Jamie's games
- Kim's games

Jamie and Kim will play ball together today (Day 1). Use a **X** to show when each of them plays ball.

Days	1	2	3	4	5	6	7	8	9	10
Jamie's Games	X									
Kim's Games	X									

Continue filling in the table.

Days	1	2	3	4	5	6	7	8	9	10
Jamie's Games	X		X		X		X		X	
Kim's Games	X			X			X			X

Jamie plays every second day. →

Kim plays every third day. →

Jamie and Kim both have a **X** on Day 1 and Day 7.

Jamie and Kim will play ball together two times in the next ten days.

Step 4: Look back.

Does your answer make sense? Did you count the **X**s again?

4. Continue filling in the table to find how many times Jamie and Kim play ball together in 20 days.

Days	1	2	3	4	5	6	7	8	9	10
Jamie's Games	X		X		X		X		X	
Kim's Games	X			X			X			X

Days	11									20
Jamie's Games										
Kim's Games										

ANSWER TO THE PROBLEM

Jamie and Kim play ball together _____ times in 20 days.

Check your answers in the Appendix.




Basic Number Facts Practice



Before you begin your Assignment Booklet activity for today, you will practise some basic division and multiplication facts.

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.



Basic Number Facts Practice

Division Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Multiplication Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Record your score on the Number Facts Progress Chart.

5. Division Number Facts

Timed Exercise: 2 minutes

$$9 \overline{)81}$$

$$6 \overline{)42}$$

$$9 \overline{)36}$$

$$6 \overline{)54}$$

$$7 \overline{)56}$$

$$64 \div 8 =$$

$$30 \div 5 =$$

$$27 \div 9 =$$

$$40 \div 5 =$$

$$48 \div 6 =$$

$$4 \overline{)36}$$

$$9 \overline{)63}$$

$$5 \overline{)25}$$

$$8 \overline{)32}$$

$$9 \overline{)72}$$

$$49 \div 7 =$$

$$48 \div 8 =$$

$$56 \div 8 =$$

$$20 \div 5 =$$

$$24 \div 6 =$$

$$7 \overline{)21}$$

$$4 \overline{)32}$$

$$6 \overline{)36}$$

$$7 \overline{)63}$$

$$4 \overline{)28}$$

Check your answers in the Appendix.



6. Multiplication Number Facts

Timed Exercise: 2 minutes

$$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$$

$9 \times 9 =$

$7 \times 3 =$

$8 \times 4 =$

$5 \times 3 =$

$5 \times 8 =$

$$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$$

$2 \times 9 =$

$8 \times 5 =$

$7 \times 8 =$

$3 \times 7 =$

$4 \times 4 =$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$$



Check your answers in the Appendix.

Turn to Assignment Booklet 6A, and complete the activities for Day 6.



What About the Leftovers?

It is a simple task to share or group a number of objects equally into smaller groups. However, there will be many times when the objects cannot be grouped equally.



Turn to page 96 in your textbook. Read the first question at the top of the page. How would you solve this problem?

For this activity you need 50 pennies to work with. If you don't have 50 pennies, use 50 counters.

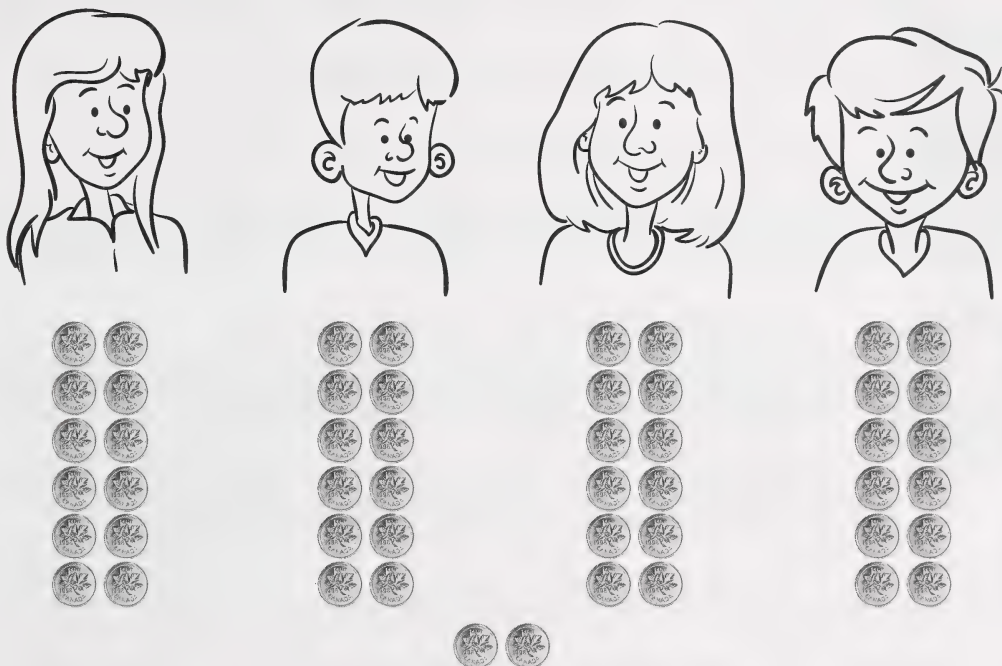


What is the problem?



You are asked to share 50¢ fairly between four children.

You could choose to share the money 1¢ at a time with each of the four children.



Each of the children receives 12¢, and there are 2¢ left over.

$$50 \div 4 = 12 \text{ with a remainder of } 2$$

or

$$50 \div 4 = 12 \text{ R}2$$

R2 stands for the
amount left over or
the remainder.





Look at the next question on page 96.

Can 50¢ be shared equally by two children with no money left over?

1. Use your counters to solve the problem.

- a. Write the division sentence here. _____
- b. Is there any **remainder**? _____ If so, what is the remainder?

Check your answers in the Appendix.

2. Suppose that three children had 50¢ to share. Can 50¢ be shared equally by three children? Solve the problem using counters.

- a. Write the division sentence here. _____
- b. Draw a sketch of your solution.

- c. Is there any remainder? _____ If so, what is the remainder?

Check your answers in the Appendix.



3. Can five children share 50¢ equally? Solve the problem using counters.

a. Write the division sentence here. _____

b. Is there any remainder? _____ If so, what is the remainder?

Check your answers in the Appendix.

Special Kinds of Remainders

Sometimes you might have to decide how to deal with a remainder. In the example on page 96 of your textbook, you discovered that $50 \div 4 = 12 \text{ R}2$. Two cents were left over. Can you divide the remainder of 2¢ among four children? No, 2¢ cannot be split four ways.

Sometimes it is possible to divide the remainder into smaller portions to be shared equally.

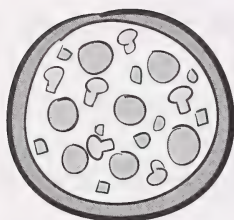
Example

Marci, Jen, and Randy are going to share 4 small pizzas. How much pizza will they each get if they share equally?

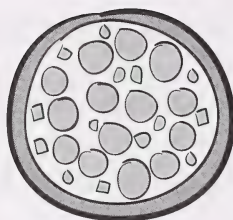
The division sentence for this problem is

$$4 \div 3 = \text{ } .$$

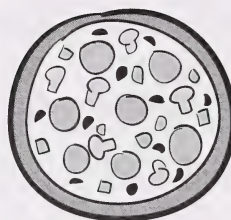




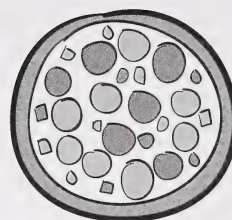
Marci



Jen



Randi

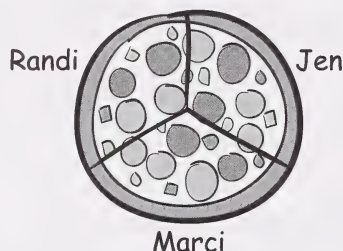


It is easy to see that each child will get one whole pizza. There will be one pizza left over.

$$4 \div 3 = 1 \text{ R}1$$

What can be done with the one leftover pizza?

They can try to divide the fourth pizza equally. They can do this by cutting the pizza into three equal pieces. These pieces are called fractions of the whole pizza.



Each fraction is one third or $\frac{1}{3}$ of the pizza.

Therefore, $4 \div 3 = 1 \text{ R}1$ or $4 \div 3 = 1\frac{1}{3}$.

Each child will get one pizza and one third of the remaining pizza.

With many story problems that you try to solve, you will have to decide how to deal with remainders. Some problems will have remainders that can be split into parts (like pizza, pie, fruit, liquids, pieces of lumber, or string). Other remainders must be left as is. They can't be split into smaller equal parts (like pennies, chairs, books, or toys).



4. Decide if the remainders in the following situations can be further divided into equal parts. Put a check mark (✓) beside either Yes or No.

- a. 29 softballs, 6 players ($29 \div 6 = 4 \text{ R } 5$)

Can the remainder be divided again? Yes _____ No _____

- b. 20 cartons of milk, 8 students ($20 \div 8 = 2 \text{ R } 4$)

Can the remainder be divided again? Yes _____ No _____

- c. 33 toys, 5 boxes ($33 \div 5 = 6 \text{ R } 3$)

Can the remainder be divided again? Yes _____ No _____

- d. 17 m rope, 4 cowboys ($17 \div 4 = 4 \text{ R } 1$)

Can the remainder be divided again? Yes _____ No _____

Check your answers in the Appendix.

Repeated Subtraction with Remainders

Now you'll look at how to work with remainders when repeated subtraction is used.

Turn to page 97 of your textbook. Look at question 1 of On Your Own.

What is the problem? You must find out how many cartons can be filled by 45 bottles if each carton holds six bottles.

The division sentence is $45 \div 6 =$.

To solve using repeated subtraction, you would write this.

$$45 - 6 = 39$$

$$39 - 6 = 33$$

$$33 - 6 = 27$$

$$27 - 6 = 21$$

$$21 - 6 = 15$$

$$15 - 6 = 9$$

$$9 - 6 = 3$$

You may use the Hundred Counting Chart in the Appendix to help you subtract.



So far, you have subtracted 6 from 45 seven times, but you aren't finished yet. You have 3 left. Since you cannot subtract 6 from 3, you know that 3 is the remainder.

$$45 \div 6 = 7 \text{ R}3$$


The complete sentence answer can be written as follows:

Reggie can fill 7 cartons with the 45 bottles, and he will have 3 bottles left over.



Note to the Home Instructor

The repeated subtraction method and the skip counting method may not be the easiest ways for your student to solve division problems that involve remainders. These methods should, however, be understood. Over time, the student will naturally choose the division method that is most comfortable for him or her to use. The Hundred Counting Chart from Day 5 of the Cut-Out Learning Aids section in the Appendix may be helpful to the student in using the repeated subtraction method.

- 
5. Go back to the page 97 in your textbook. Look at question 2 of On Your Own.

You are asked to find how many cartons Martina can fill if she has 73 bottles and each carton holds 6 bottles.

- a. Write the division sentence for the problem. _____
- b. Use repeated subtraction to solve this problem. Show your work.
(The first subtraction is shown for you.)

$$73 - 6 = 67$$

$$67 - 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

$$- 6 =$$

- c. How many times was 6 subtracted from 73? _____
- d. What is the solution to the problem? _____
- e. Write a complete sentence that answers the problem.

Check your answers in the Appendix.



Just For Fun



For extra practice when dividing with remainders, you may wish to try this partner game with your home instructor, a friend, or a family member.



Turn to pages 184 and 185 of your textbook. The game shown on these pages is to be played by two players. You will need 36 tiles (these could be cut from coloured paper) and two number cubes (dice) with dots for the numbers 1 through 6.

Read the directions to the Arrays and Remainders game very carefully and follow the rules.

Have fun!



Note to the Home Instructor

It may be necessary to help the student the first time this game is played. The instructions are straightforward. Remainders must be kept by the player. The number of tiles is reduced in the next round of play. This game reinforces the relationship between multiplication and division and also helps the student recall basic facts.

For more advanced players, number cubes can be changed to include the numbers 7, 8, and 9 in order to practise more difficult division and multiplication problems. Eighty-one tiles would be needed to start the more advanced game.

Turn to Assignment Booklet 6A, and complete the activities for Day 7.



Putting It All Together (I)

In Section 1 you learned several important things about division:

- Division is sharing or grouping items into smaller, equal groups.
- Division can be shown in arrays of rows and columns.
- Division can be thought of as skip counting backward.
- Division can also be thought of as repeated subtraction.
- Division and multiplication are related.
- Sometimes division creates remainders.

In this section you also practised your basic multiplication and division facts, and you learned how to use the Making a Table strategy for problem solving. You also practised quick ways to divide by 1, 10, 100, and 1000.



Today you will show what you have learned about division by completing several review questions. You will then work on a Challenge Activity related to the activities you have been working on in Section 1.

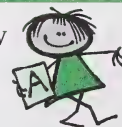
Part 1: Reviewing the Concepts

For Part 1 you will complete all of the review questions for Day 8 in Assignment Booklet 6A. First, you may wish to look back through the Student Module Booklet to review the concepts covered in Section 1.

Part 2: Challenge Activities

The Challenge Activities in Part 2 will add to the ideas you have been learning about so far in Module 6, and will help you think about division further. In Assignment Booklet 6A, you will find two Challenge Activities. Choose **either** Activity A **or** Activity B (**or** you may do both if you wish).

Turn to Day 8 in Assignment Booklet 6A, and complete all of the review questions in Part 1. Then do one or both of the Challenge Activities in Part 2.



Assessing What You Know (I)

Today is the last day you will be working in Section 1. You will complete two activities in Assignment Booklet 6A:

- Showing What You Can Do
- Basic Number Facts

Read the explanations of the activities in Parts 1 and 2 before turning to Assignment Booklet 6A. Note that you will need the help of your home instructor for the activities in Parts 1 and 2.



Part 1: Showing What You Can Do



For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions such as the following:

- “How do you know that?”
- “Why did you decide to do that?”
- “How did you get that answer?”

Your job is to explain what you are doing so that your home instructor can understand your thinking.



Note to the Home Instructor

This performance assessment should take about 20 minutes. The Home Instructor's Assessment Page and accompanying Student's Assessment Page can be found in Day 9 of Assignment Booklet 6A. Remove both pages from the Assignment Booklet. Read over the student's page so you are familiar with the student's assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem.** You may or may not wish to use some of the interview questions. Look for understanding and the student's ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

Part 2: Basic Number Facts

In this activity, you will show how well you are doing at learning your basic number facts for multiplication and division. Your home instructor will time you as you do each test.

When your home instructor is ready, turn to Assignment Booklet 6A and complete the activities found in Parts 1 and 2 of Day 9.



This is the end of Section 1: Understanding Division. Check over Assignment Booklet 6A to make sure you have completed all of the assigned activities for each day. Remember that for Day 8 you need to complete the review questions in Part 1 and one or both Challenge Activities in Part 2.

Be sure to attach the **two** assessment pages from Day 9 to Assignment Booklet 6A. Then send Assignment Booklet 6A to your teacher.

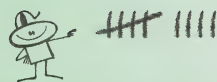




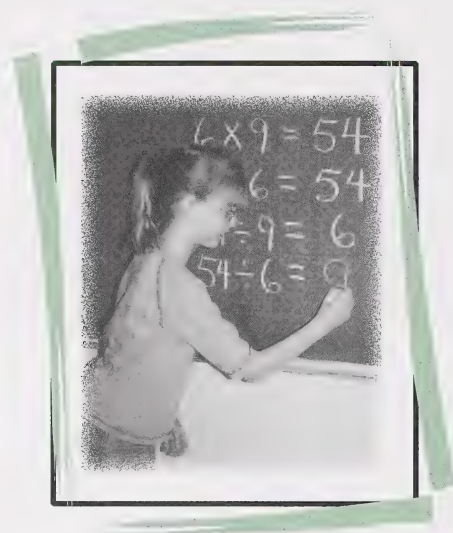
Section 2

Extending Your Division Skills





Working with Remainders



Using Related Facts

The basic multiplication facts are helpful when solving division questions. You already know that the division and multiplication facts are related. You also know that you can use the multiplication facts to find answers to division questions.

Here are two ways of writing the same basic division question.

$$32 \div 4 = \square$$

$$4 \overline{)32}$$

1. Write a related multiplication fact that would help you solve this question. _____



Check your answer in the Appendix.

The multiplication fact $4 \times 8 = 32$ helps you know that 8 is the number needed to make the division fact $32 \div 4 = \square$ true.

2. For each of the following, write the number that makes the division fact true. Then write a multiplication fact that helps you know this. An example is done for you.

Example: $5 \overline{)45}^9$ $5 \times 9 = 45$

a. $7 \overline{)28}$ _____

b. $4 \overline{)24}$ _____

c. $6 \overline{)48}$ _____

d. $9 \overline{)54}$ _____

e. $8 \overline{)56}$ _____

Check your answers in the Appendix.

Estimating in Division

You have already learned how to **estimate** by rounding to the nearest 10. For example, to estimate the sum of $28 + 39$, you would simply round each number **up** to the nearest 10 and then add the rounded numbers.

$$\begin{array}{r} 28 \rightarrow 30 \\ + 39 \rightarrow + 40 \\ \hline 70 \end{array}$$

When you do division, it is usually more useful to round **down** to find a multiple.

Example

A ticket for a ride at the fair costs \$3. How many tickets can you buy for \$25?



Division will be used to solve this problem, but you will also need to use a related multiplication fact.

You know that there is no multiplication fact that has 3 and 25 in it. Instead, you should think of a multiplication fact with a product that is **close to but smaller than 25** (the dividend).

$$3 \overline{)25}$$

Think: $3 \times \text{ } = 25$

There is no multiplication fact that uses 3 and 25 because 25 is **not** a **multiple** of 3.

In your head, round down to a smaller multiple of 3. Try using 24.

Think: $3 \times \text{ } = 24$

$$3 \times 8 = 24$$

$$3 \overline{)25} \begin{array}{l} 8 \end{array}$$

← Write 8 above the 5. This is a good estimate because 8×3 is close to but less than 25. The number 24 is the largest multiple of 3 below 25.

$$\begin{array}{r} 8 \\ 3 \overline{)25} \\ - 24 \\ \hline 1 \end{array}$$

Multiply.

$$8 \times 3 = 24$$

Write 24 below 25 and subtract. The remainder is 1. This tells you that there will be \$1 left over.

You can buy 8 tickets with \$25.

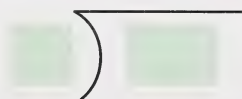
Here is another division problem that can be solved easily using a basic multiplication fact. **Remember, the fact you choose must have a product equal to or less than the dividend.**

There are 38 sheep to be sorted equally into 4 separate pens. How many sheep will you put in each pen? Will there be any sheep left over?



This division problem asks you to find “how many in each group.”

3. Begin by writing the question using the $\overline{)}$ symbol. Put in the numbers 38 and 4.



4. Is there a multiplication fact that uses the numbers 4 and 38? _____

Check your answers in the Appendix.



5. In your head, round the dividend **down** to a multiple of 4 that is smaller than 38.

Think: $4 \times \square = \square$

To do this, think of a multiplication fact that begins with 4 and has a product that is close to but not larger than 38.

Write the multiplication fact you are thinking of.

Check your answer in the Appendix.



6.

$$\begin{array}{r} 4 \overline{) 38} \\ \underline{} \end{array}$$

Ask yourself, "If I have 38 sheep, how many can be put in each of the 4 pens?"

Write your answer above the 8.

To complete the problem, multiply 4×9 in your head.

7. What is the product of 4×9 ? _____

Write this number under the 38 and then subtract. The answer you get is the remainder.

8. What is the remainder for this question? _____

9. What does the remainder tell you?

Check your answers in the Appendix.

10. Solve the following division questions. Use a multiplication fact to help you solve each one. Write the remainder beside the quotient.

a. $7 \overline{) 23}$

b. $8 \overline{) 19}$

c. $6 \overline{) 32}$

d. $8 \overline{) 41}$

Check your answers in the Appendix.

Division Using Base Ten Blocks

In Module 5 you saw how building rows of base ten blocks can help you understand multiplication.



Today you will use the same idea to help you understand division problems. Find your base ten blocks and remove the \times/\div Mat from Day 10 in the Cut-Out Learning Aids section of the Appendix. If you do not have a set of base ten blocks, you will need the cutouts for Day 10 that are also found in the Appendix.

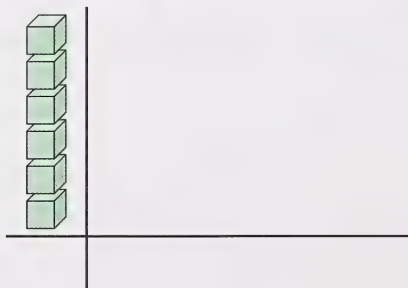
Look at the following problem.

A box with 24 pencils was split evenly between 6 students. How many pencils did each student get?

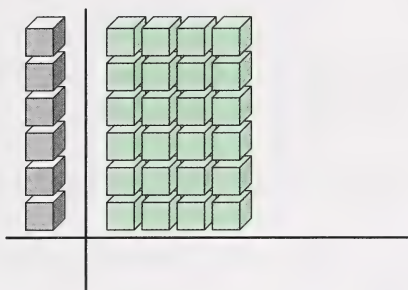


The division sentence for this problem is $24 \div 6 =$. From this you know that you will need to arrange your base ten blocks in six rows.

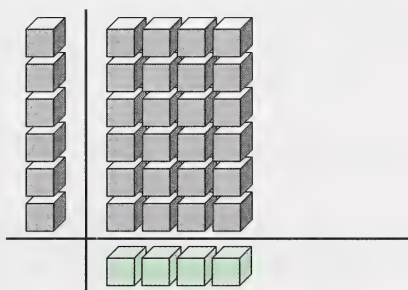
To show that you will be making six rows, place 6 ones cubes along the left axis on the \times/\div mat.



Next, arrange 24 ones cubes on the mat to show the division in this question (24 cubes divided into six rows). Your cubes should look like this.



The answer to the question is found by counting the number of cubes in each row after all 24 cubes have been placed on the mat. To show that the answer is 4, place 4 ones cubes below the bottom axis.



11. Describe in words how you placed your cubes in rows.

12. Write a sentence answer to the problem.

Check your answers in the Appendix.





13. Use your base ten blocks and \times/\div mat to show the answers to the following division questions. For each question, you need to do **three** things:

- Place the correct number of blocks along the vertical axis to show how many rows are needed.
- Arrange the correct number of base ten blocks in rows on the mat.
- Place blocks along the bottom axis to show the number of blocks in each row.

a. $21 \div 3 =$

b. $32 \div 4 =$

Number in each row: _____

Number in each row: _____

c. $35 \div 7 =$

d. $36 \div 6 =$

Number in each row: _____

Number in each row: _____

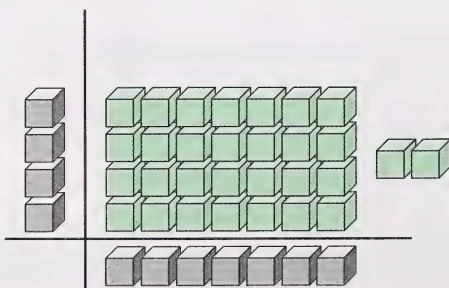
Check your answers in the Appendix.



You can also show division with remainders using your base ten blocks. After you have arranged your rows of blocks on the mat, the leftover blocks are placed to the right.

Example

$30 \div 4 =$



This shows the answer
7 R2.

14. Use your base ten blocks and \times/\div mat to show the answer to each of these division questions.

a. $29 \div 5 =$

Number in each row: _____

Number left over (remainder): _____

b. $23 \div 3 =$

Number in each row: _____

Number left over (remainder): _____

Check your answers in the Appendix.

Remainders Are Important

The remainder in a division problem can be very important in helping you arrive at a sensible answer. If an answer has a remainder, you should ask yourself, "What does the remainder tell me?"

Look at the following example to see how the remainder can help you decide on an answer.

There are 35 students in Steven's class. The teacher wants to divide the class into 4 groups that are equal or nearly equal in size. How many students will be in each group?



Try thinking about this problem as if you were using rows of base ten blocks.

“If I divide 35 blocks into 4 rows, how many blocks will be in each row?”

The division sentence for this problem is $35 \div 4 =$.



15. a. Use your base ten blocks to show the division on your \times/\div mat.

b. How many rows are there? _____

c. How many blocks are in each row? _____

d. Are there any blocks left over? _____ How many? _____

e. What do the leftover blocks tell you?

f. What is the answer to the problem?

Check your answers in the Appendix.



In question 15 the remainder was very important in helping you decide how big to make each of the four groups. Sometimes the remainder may not be as important. For example, when you are asked only for an estimate, you might choose to ignore the remainder.

16. Solve the following problem. Decide whether the remainder in your calculation is important.

Trevor can write his whole name in 5 seconds. About how many times can he write his name in 44 seconds?

Division sentence: $44 \div 5 =$

Solution: Fill in the blanks.

$$\begin{array}{r} 5 \overline{) 44} \\ - \\ \hline \end{array}$$

ANSWER TO THE PROBLEM

Check your answers in the Appendix.

In question 16 you were asked only to estimate “about how many times.” If you ignore the remainder, the answer would be “about eight times.” You could also estimate by using a close multiplication fact.

$$5 \times 8 = 40 \text{ or } 5 \times 9 = 45$$



Both multiplication facts have products close to 44. Both could be used to estimate the number of groups of 5 seconds in 44 seconds (or the number of times Trevor could write his name). An estimate of 8 or 9 times would be a good estimate.

In this problem, the remainder was less important in helping you decide on your answer to the problem.

For the following two story problems, estimate the answers. Give a sentence answer for each that uses the word “about.”

17. Leah’s dance group performed 4 dances for a dance competition on the weekend. The group was allowed only 25 minutes to complete all 4 dances. About how many minutes did the group spend on each dance?



Division sentence: _____

Solution:

ANSWER TO THE PROBLEM

18. The price of cookies at the local bakery is 6 cookies for 55¢. About how much does 1 cookie cost?

Division sentence: _____

Solution:



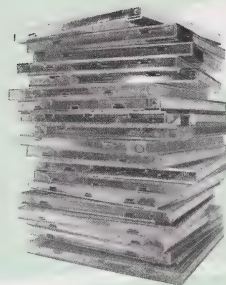
ANSWER TO THE PROBLEM

Check your answers in the Appendix.



Now look at another example.

Suppose you have 26 CDs that need to be put in storage boxes. Each storage box holds 8 CDs. How many storage boxes do you need to buy?



Division sentence: $26 \div 8 =$

Solution:
$$\begin{array}{r} 3 \text{ R}2 \\ 8 \overline{)26} \\ \underline{-24} \\ 2 \end{array}$$

← The remainder tells you that if you have only three boxes, there will be two CDs left over.

ANSWER TO THE PROBLEM

You would need to buy four storage boxes to hold all 26 CDs.

This example shows a case where the remainder is very important in helping you write a sensible answer to the problem.

Try the following two story problems. Look carefully at the remainders to see if they help you arrive at answers that make sense. Use your base ten blocks, if needed, to help you solve each problem. Write your answers in a word sentence.

19. Dawn's dance group needs 1 pair of white gloves for each dancer. There are 34 dancers in the group. The gloves must be ordered by the box. There are 6 pairs of gloves in each box. How many boxes need to be ordered if each dancer is to get 1 pair of gloves?



Division sentence: _____

Solution:

ANSWER TO THE PROBLEM

Check your answers in the Appendix.



20. Phillip plans to give all of the students in his class an ice-cream cone. There are 28 students in his class. At the store, he discovered that the cones come in boxes of 8. How many boxes does he need to buy in order to have enough cones for everyone?



Division sentence: _____

Solution:

ANSWER TO THE PROBLEM



Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 10.





Checking the Answer

Using Related Facts

In Day 4 you learned that multiplication and division are related operations. Each multiplication fact has a related division fact. You can use the related multiplication fact to check your answer to a division question.

Example

Check to see if the answer to this question is correct.

$$56 \div 7 = 9$$

The related multiplication fact is found by turning the question around and asking

“Does 9×7 equal 56?”

By remembering your basic multiplication facts or by looking at the multiplication table, you can see that 9×7 does **not** equal 56. Therefore, you know that $56 \div 7$ does **not** equal 9.

You know that $56 \div 7 = 8$ because the related multiplication fact is

$$7 \times 8 = 56 \quad \text{or} \quad 8 \times 7 = 56$$

You also can use related facts to help you check division questions that have remainders.



Example

Check to see if the answer to this problem is correct.

$$43 \div 5 = 8 \text{ R}3$$

Turn the problem around and use the related multiplication fact.

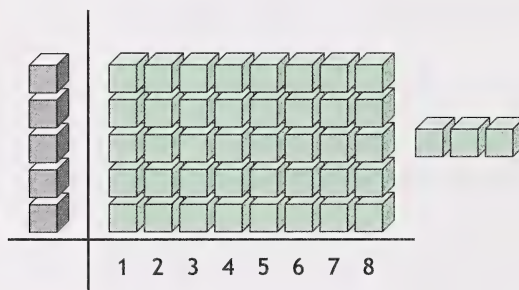
"Does 8×5 plus 3 = 43?"

You know that 8×5 equals 40 and $40 + 3 = 43$. Therefore, the answer 8 R3 is correct.



To double-check that this is the correct answer, use your base ten blocks to solve the question.

Place 43 ones cubes on the \times / \div mat in five rows.



There are five rows of eight cubes and there are three cubes leftover.

$$5 \times 8 = 40 \rightarrow 40 + 3 = 43$$

↑
Remainder

Forty-three is the dividend or the number you started with, so you know that the answer 8 R3 is correct.

Example

Check the answer to this problem.

$$39 \div 6 = 6 \text{ R}2$$

Think: Is $6 \times 6 + 2$ equal to 39?

Check: $6 \times 6 = 36$

$$36 + 2 = 38 \quad \text{Not 39!}$$

Therefore, $39 \div 6$ does **not** equal 6 R2.

To make the answer correct, the remainder must be made larger.

$$6 \times 6 = 36$$

$$36 + 3 = 39$$

The remainder should be 3, not 2.

$$39 \div 6 = 6 \text{ R}3$$

1. Double-check your solution by using base ten blocks. Use 39 unit cubes and place them in six rows.

Check your answers in the Appendix.



2. Check the answers to the following division problems by using the related operation (multiplication). Use your multiplication table if you wish. Fill in the blanks in each question and then tell if the division sentence is correct.

a. $26 \div 4 = 6 \text{ R}2$

Think: Is $4 \times 6 + 2$ equal to 26?

Check: $4 \times 6 =$ _____

↓

_____ + 2 = _____

The division sentence, $26 \div 4 = 6 \text{ R}2$, is _____
(correct, not correct)

b. $50 \div 6 = 8 \text{ R}3$

Think: Is $6 \times 8 + 3$ equal to 50?

Check: $6 \times 8 =$ _____

↓

_____ + 3 = _____

The division sentence, $50 \div 6 = 8 \text{ R}3$, is _____
(correct, not correct)

c. $33 \div 7 = 5 \text{ R}2$

Check: $7 \times 5 =$ _____

↓

_____ + 2 = _____

The division sentence, $33 \div 7 = 5 \text{ R}2$, is _____
(correct, not correct)

3. Solve the following division problems. Use multiplication to check your answers.

a. $19 \div 4 =$ _____ R _____

Related multiplication fact:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Check:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \text{ (Remainder)}$$

b. $29 \div 3 =$ _____ R _____

Related multiplication fact:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Check:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \text{ (Remainder)}$$

c. $42 \div 5 =$ _____ R _____

Related multiplication fact:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Check:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \text{ (remainder)}$$

d. $70 \div 9 =$ _____ R _____

Related multiplication fact:

Check: $\begin{array}{ccc} \underline{\hspace{2cm}} & \times & \underline{\hspace{2cm}} \\ \downarrow & & \downarrow \end{array} = \underline{\hspace{2cm}} \begin{array}{c} \downarrow \end{array}$

$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$
(Remainder)



Check your answers in the Appendix.

Mental Math



Zapping the Zeros Again!

Suppose you have been given the great job of sharing \$150 equally among 5 of your best friends. How would you do it?



Would you share the money \$1 at a time? Probably not. It would take a very long time.

It would be better to try to find a fast way to divide.

You already know a strategy for dividing by 10 and 100. It's called Zapping the Zeros! You can use the same strategy when only the number being divided ends in zeros. You still zap the zeros, but you must remember to tack them back on when you're finished calculating.

Example

$$150 \div 5 =$$

Look at the numbers carefully. If you were to zap the zero by taking the zero off 150, you would have 15. The question would then be $15 \div 5 =$. This looks like a basic fact that you already know.

$$15 \div 5 = 3$$

Now, put the zero back into the answer. Instead of 3, the answer is 30.

$$150 \div 5 = 30$$

Your friends will each get \$30.

This mental math strategy gives you a very quick method of doing division in your head.

If the dividend has any zeros at the end of it, try zapping the zeros to help you solve the problem.

Example

You have 2400 raffle tickets that need to be put into 4 booklets. How many tickets will go into each booklet?

$$2400 \div 4 =$$

Zap the zeros.

$$24 \div 4 =$$

Remember your basic facts!

$$24 \div 4 = 6$$

Now, put the zeros back in the answer.

$$2400 \div 4 = 600$$

Each booklet will have 600 tickets in it.

4. Use the Zap the Zeros method to help you solve these questions in your head. Remember to put the zeros back in the answer.

a. $350 \div 7 =$ _____

b. $4200 \div 6 =$ _____

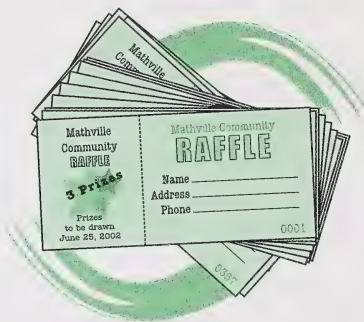
c. $1800 \div 2 =$ _____

d. $2100 \div 3 =$ _____

e. $270 \div 9 =$ _____

f. $540 \div 9 =$ _____


Check your answers in the Appendix.



Basic Number Facts Practice



Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.



Basic Number Facts Practice

Multiplication Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Division Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Record your score on the Number Facts Progress Chart.

5. Multiplication Number Facts

Timed Exercise: 2 minutes

$4 \times 5 =$

$5 \times 8 =$

$4 \times 9 =$

$6 \times 8 =$

$5 \times 5 =$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$2 \times 9 =$

$7 \times 6 =$

$4 \times 8 =$

$3 \times 7 =$

$5 \times 6 =$

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$$

$6 \times 6 =$

$8 \times 4 =$

$9 \times 5 =$

$8 \times 6 =$

$9 \times 3 =$



Check your answers in the Appendix.



6. Division Number Facts
Timed Exercise: 2 minutes

$42 \div 7 =$ $20 \div 4 =$ $27 \div 9 =$ $45 \div 5 =$ $25 \div 5 =$

$7 \overline{)49}$ $5 \overline{)35}$ $3 \overline{)18}$ $8 \overline{)48}$ $6 \overline{)30}$

$40 \div 5 =$ $42 \div 6 =$ $28 \div 4 =$ $24 \div 6 =$ $35 \div 7 =$

$5 \overline{)30}$ $6 \overline{)48}$ $3 \overline{)24}$ $9 \overline{)36}$ $9 \overline{)45}$

$36 \div 6 =$ $18 \div 9 =$ $27 \div 3 =$ $32 \div 8 =$ $21 \div 7 =$



Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 11.





Deciding Which Operation to Use



How do you know which operation to use when you're trying to find a solution to a problem?

Do you **add** to find the answer? Do you **subtract**? Do you **multiply**? Do you **divide**? Do you do more than one operation?

Today you will review the things you should look for when deciding how to solve story problems.

There are four operations to choose from when you solve a story problem:

- addition
- subtraction
- multiplication
- division

To solve story problems, try looking for **clue words** to help you decide which operation to use.



Review of Story Problems

Addition Problems

Addition problems ask you to find a total number of items. For example, the following problem asks you to find the total number of people at a ball game.

At last Saturday's Little League game, there were 24 ball players in the game, 4 coaches on the sidelines, 3 umpires in the field, and 58 fans watching from the stands. How many people in all were present at the game?



Clue words like *in all* or *altogether* tell you that you need to find a total number of items to correctly answer the problem.

Addition problems usually describe several different numbers. In the same problem, the numbers 24, 4, 3, and 58 are given. To find the total, you must add these numbers.

$$24 + 4 + 3 + 58 =$$

$$24 + 4 + 3 + 58 = 89$$

There were 89 people in all at the ball game.

Multiplication Problems

Multiplication problems also ask you to find a total number of items. The difference between an addition problem and a multiplication problem is this:

- Adding will solve a problem with several items of **different** size (like the problem about the ball game).
- Multiplying will solve a problem with several groups of items of the **same** size.

For example, multiplying could be used to solve the following problem.

How many hamburger buns are there in all if Joni buys 6 bags of buns with 12 buns in each bag?



Notice the clue words *in all*. Addition could be used to solve this problem, but it is better (and faster!) to use multiplication.

There are six bags (or groups). There is an equal number of items in each bag (12). Six groups of 12 is the same as 6×12 .

To solve, multiply.

$$6 \times 12 =$$

$$6 \times 12 = 72$$

There are 72 hamburger buns in all.

Clue words like *groups*, *packages*, *teams*, or *each* with words like *in all* and *altogether* mean that you probably should try multiplying to solve the story problem.

1. Read the following problems. Decide whether you would use addition or multiplication to solve the problem. Look for clue words to help you decide. **Note:** You **do not** need to actually solve the problems.

- a. Several trees were delivered to the nursery. There were 18 spruce trees, 20 ash trees, and 32 willows. How many trees were there altogether?

Operation: _____

- b. Seven packs of hockey cards were found on the sidewalk. There were 8 cards in each pack. How many cards in all were found on the sidewalk?

Operation: _____

- c. How much money would you have if you sold 9 bags of popcorn and each bag cost 25¢? (**Hint:** Think in groups of 25¢.)

Operation: _____



- d. On Thursday, James measured 35 mm of rainfall. On Friday, he measured 17 mm of rainfall. On Saturday, 40 mm of rainfall were measured. How much rainfall was measured in all?

Operation: _____

Check your answers in the Appendix.



Subtraction Problems

Subtraction problems often involve finding out *what is left* after something is taken away. They are about finding *differences*. The number that you end up with is *less than* the number you started with. Subtraction problems could also ask *how much more* or *how many fewer*.

Example

Jon went to the country fair with \$8.50 in his pocket. After going on some rides, he had only \$1.75 to spend on his supper. How much money did Jon spend on the rides?



Jon started with \$8.50 and ended up with \$1.75. You have to find the difference between these amounts.

$$\$8.50 - \$1.75 =$$

$$\$8.50 - \$1.75 = \$6.75$$

Jon spent \$6.75 on the rides at the fair.

Division Problems

Division involves sharing equally or making equal groups. You start with a large number, share this number equally, and then end up with a smaller number.

Division problems say things like the following:

- How many packages of balloons would you have?
- How many students would be on each team?

Example

The school received 72 new desk chairs to be shared equally in the classrooms. If there are 8 classrooms at the school, how many chairs will each classroom get?



You start with a large number, 72 chairs, and share this number equally among 8 classrooms. You will end up with a smaller number.

$$72 \div 8 =$$

$$72 \div 8 = 9$$

Each classroom will get nine new chairs.

2. Read the following problems. Decide whether you would use subtraction or division to solve each problem. Look for clue words to help you decide. **Note:** You **do not** need to actually solve the problems.

- a. How much change would you get from \$5.00 if you buy a magazine that costs \$3.99?

Operation: _____

- b. How many teams of 9 players could you make from a group of 65 students?

Operation: _____

- c. Randi weighs 32 kg. Last year at this time he weighed 25 kg. How much weight has he gained?

Operation: _____

- d. Nancy has to pour 38 L of orange punch into punch bowls for the graduation banquet. Each bowl holds 4 L of punch. How many bowls will she need?

Operation: _____



Check your answers in the Appendix.

Mental Math: Multiplying and Dividing By 10 and 100



Now you will look at multiplying and dividing large numbers using 10 and 100. To do this, you will use a table.

Tacking on Zeros

Do you remember a mental math strategy you used to help you multiply by 10 and 100 in your head?

- To multiply a number by 10, tack on ONE zero.
- To multiply a number by 100, tack on TWO zeros.

Use the Tacking the Zeros strategy to help you answer the following questions.

3. a. What is 50×10 ? _____ Write this number in the table.

	$\times 10$	$\times 100$
50	500	
6	60	
56		

- b. What is 6×10 ? _____ Write this number in the table.

- c. Fill in the other four answers in the table. Use the Tacking On Zeros strategy to help you find each answer.

Check your answers in the Appendix.

Fill in the next two tables using the same strategy.

4.

	$\times 10$	$\times 100$
70		
8		
78		

5.

	$\times 10$	$\times 100$
40	<u> </u>	<u> </u>
5	<u> </u>	<u> </u>
45	<u> </u>	<u> </u>



Check your answers in the Appendix.

6. Look carefully at the three tables you just filled in. What patterns do you notice in the numbers you wrote? (What is happening that is the same in all three tables?)

7. How do the digits in a number move when the number is multiplied by 10 or 100?



Check your answers in the Appendix.

8. a. Fill in the six missing numbers in this table.

	$\times 10$	$\times 100$
	900	
		700
	970	

- b. How did you find the numbers in the shaded squares?

- c. Which direction do the digits in a number move when you divide the number by 10 or 100?



Check your answers in the Appendix.

9. Fill in the missing numbers in each table.

a.

	$\times 10$	$\times 100$
		4000
	20	

b.

	$\times 10$	$\times 100$
		6800

c.

	$\times 10$	$\times 100$
	390	



Check your answers in the Appendix.

10. Write a rule or strategy to explain how to divide a number by 10 or 100 in your head. Instead of the Tacking on Zeros strategy, what might you call your division strategy?



Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 12.



Division in Three Steps

So far in this module you have learned several different ways to solve division problems:

- using base ten blocks
- using counters to sort and group
- drawing a picture
- using number lines
- skip counting backward
- using related multiplication facts
- estimating the solution

Today's lesson will show you a three-step method for solving division problems. You will continue to use this method in later grades when you have to solve more difficult problems.

In your solutions, you will be using the following three steps:

- Step 1: Estimate
- Step 2: Multiply
- Step 3: Subtract

Example

The school choir has been asked to sing at the local music festival. The choir has 34 members. There are 4 rows of riser (or steps) on the stage where they will stand to perform. How many of the choir members can stand in 4 equal rows? Will there be any choir members left to stand elsewhere?

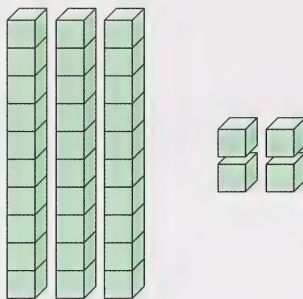


The problem asks you to divide 34 into four equal rows.

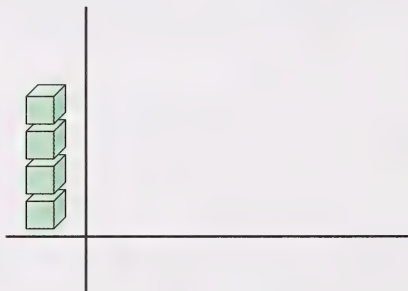
$$4 \overline{)34}$$



Find your base ten blocks and the \times/\div mat. Begin by showing 34 using 3 tens rods and 4 ones cubes. Lay these out on your desktop.



The problem asks you to make four equal rows. On your \times/\div mat, place four extra cubes along the vertical axis to show that you are making four rows.



1. a. Can you place the tens rods on the mat so that there is 1 ten in each row? _____

- b. Tell why or why not.



Check your answers in the Appendix.

You can see that it is not possible to divide the 3 tens equally into four rows. In order to share the tens in all four rows, you must regroup the tens as ones.

2. a. Trade the 3 tens for ones. How many ones cubes will you use?

- b. Altogether how many ones do you now have? _____

- c. Put the 34 ones in four rows until you have four equal rows on the mat.

3. a. Were you able to put all 34 cubes in four equal rows? _____

- b. How many cubes did you put in each row? _____

- c. How many cubes did you use to form the rectangle on the mat?

- d. How many cubes were left over? _____



Check your answers in the Appendix.

By using the base ten blocks and the mat, you were able to show that 34 **cannot** be divided evenly into four equal rows. There is a remainder of 2.

In other words, 34 choir members cannot stand in four equal rows on the risers. Only 32 choir members can stand in four rows of eight each. Two members must stand elsewhere.

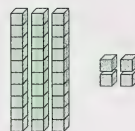
Here is another way to solve the same division problem using the three steps:

- Step 1: Estimate
- Step 2: Multiply
- Step 3: Subtract

The problem asks you to divide 34 into four equal rows.

$$4 \overline{) 34}$$

Remember, 34 is made up of 3 tens and 4 ones.



Step 1: Estimate

Think: How many 4s are in 34?

Think: What is a related multiplication fact?

$$4 \times 8 = 32$$

Write: Write 8 above the 4 in 34.

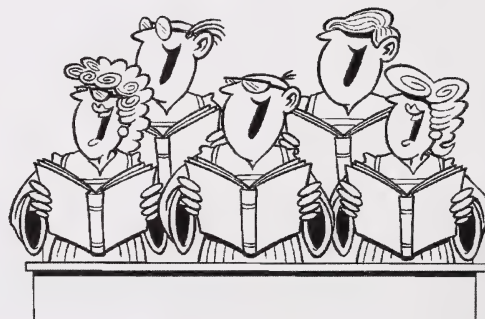
$$4 \overline{) 34}^8$$

Step 2: Multiply

Multiply: $4 \times 8 = 32$

Write: Write 32 below 34.

$$\begin{array}{r} 4 \overline{) 34}^8 \\ - 32 \\ \hline \end{array}$$



Step 3: Subtract

Subtract: $34 - 32 = 2$

Write: Write the 2 at the top as the remainder.

$$\begin{array}{r} 8 \text{ R}2 \\ 4 \overline{)34} \\ - 32 \\ \hline 2 \end{array}$$

ANSWER TO THE PROBLEM

The 34 choir members cannot stand in four equal rows on the risers. Only 32 choir members can stand in four rows of eight each. Two members must stand elsewhere.

Now try another division question using this three-step method. If you like, use your base ten blocks as you work through the steps.

Example



There are 27 students signed up for gymnastics. Teams of 8 members are required for the first competition. How many teams of 8 could there be? Will there be students left over?

$$8 \overline{)27}$$


Step 1: Estimate

Think: How many 8s are in 27?

Think: If I put eight in a row, how many rows can I make?

4. a. What is a related multiplication fact?

- b. Write your estimate above the 7.


$$\begin{array}{r} 8 \overline{) 27} \end{array}$$

Check your answers in the Appendix.

Step 2: Multiply

Multiply 8×3 .

5. a. $8 \times 3 =$ _____

- b. Write this product under the 27.

$$\begin{array}{r} 3 \\ 8 \overline{) 27} \\ \underline{} \\ \end{array}$$

Check your answers in the Appendix.



Step 3: Subtract

Subtract 24 from 27.

6. a. $27 - 24 =$ _____

b. Write this number below the 4.

$$\begin{array}{r} 3 \\ 8 \overline{) 27} \\ - 24 \\ \hline \end{array}$$

7. a. What is the remainder? _____

b. Write the question as a division sentence. Show the answer and the remainder.

c.

ANSWER TO THE PROBLEM

Check your answers in the Appendix.



Try the following questions on your own. Follow the three steps.

8. $42 \div 5 =$

$$\begin{array}{r} 5 \overline{) 42} \\ - \\ \hline \end{array}$$

← Step 1: Estimate

← Step 2: Multiply

← Step 3: Subtract

$42 \div 5 =$ _____

9. $52 \div 7 =$

$$\begin{array}{r} 7 \overline{) 52} \\ - \\ \hline \end{array}$$

$52 \div 7 =$ _____

10. $39 \div 6 =$

$$\begin{array}{r} 6 \overline{) 39} \\ \underline{} \\ \end{array}$$

$39 \div 6 =$

11. $62 \div 9 =$

$$\begin{array}{r} 9 \overline{) 62} \\ \underline{} \\ \end{array}$$

$62 \div 9 =$

12. $50 \div 8 =$

$$\begin{array}{r} 8 \overline{) 50} \\ \underline{} \\ \end{array}$$

$50 \div 8 =$ _____



Check your answers in the Appendix.

Mental Math



What About Zero?

You know from learning multiplication facts that zero times any number results in zero. For example, $0 \times 5 = 0$.

Remember that multiplication is related to division. Therefore, if $0 \times 5 = 0$, then $0 \div 5 = 0$. (Zero things divided into five groups results in zero things in each group.)

13. Try the following questions.

a. $0 \div 9 =$ _____

b. $0 \div 14 =$ _____

c. $0 \div 26 =$ _____

d. $0 \div 59 =$ _____

e. $0 \div 167 =$ _____

f. $0 \div 632 =$ _____



Check your answers in the Appendix.

You may also find problems like $6 \div 0 = \square$. This problem does not make sense and is actually impossible. Use multiplication to check it out.

Turn it around.

If $6 \div 0 = \square$, then $\square \times 0 = 6$.

There is no number that can be multiplied by zero to give you a product of 6. Zero times any number always equals zero!

Dividing by zero is impossible!

All of these problems are impossible:

• $12 \div 0 = \square$ • $46 \div 0 = \square$

• $30 \div 0 = \square$ • $122 \div 0 = \square$

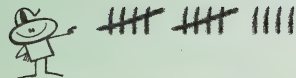
14. Write **three** other division problems that are impossible to solve.

- _____
- _____
- _____

Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 13.





Dividing Money Amounts

In Day 13 you learned how to use the three-step method to find answers to simple division problems. In today's lesson you will practise estimating quotients to help divide money amounts.

Estimating Quotients

Estimate to find the quotient for the following problem.

If 2 people share \$62 equally, about how much money does each person receive?

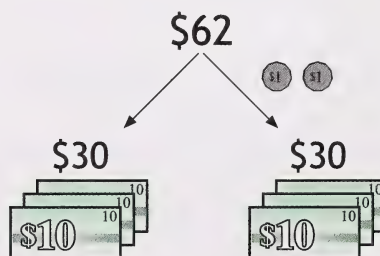
The operation for solving this problem is division. To estimate the answer to $62 \div 2 =$, begin by thinking of a simple related division fact.

Divide $2 \overline{) 6}^3$.

Then change the 2 in the ones column to zero and think 60 (or 6 tens) divided by 2 is 30 (or 3 tens).

$$2 \overline{) 60}^{30}$$

Each person would receive about \$30.



1. Estimate the quotient. Fill in the blanks.

If 4 people share \$83 equally, about how much does each person receive?

The operation for solving this problem is division or $83 \div 4 =$.

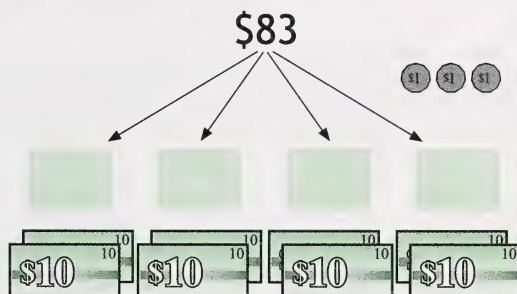
To estimate $4 \overline{)83}$, think of a simple related division fact.

Divide $4 \overline{)8}^2$.

Then change the 3 in the ones column to zero and think 80 divided by 4 is 20.

$$4 \overline{)80}^{20}$$

Each person would receive about \$20.



2. For each question, think of a related division fact. Then estimate the quotient.

a. $3 \overline{)60}$

b. $2 \overline{)80}$

c. $6 \overline{)60}$

d. $2 \overline{)44}$

e. $5 \overline{)56}$

f. $3 \overline{)71}$

g. $4 \overline{)84}$

h. $7 \overline{)74}$



i. $3 \overline{)95}$

j. $2 \overline{)83}$

k. $6 \overline{)76}$

l. $3 \overline{)77}$

Check your answers in the Appendix.

Dividing Money into Equal Shares

Sometimes when you are asked to divide money into equal shares, the money divides easily.

Example

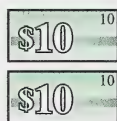
If \$84 is shared equally by 4 people, how much will each person receive?



Divide $84 \div 4$. The first number you use is 2. You can share 8 tens equally among 4 people.

$$\begin{array}{r} 2 \\ 4 \overline{)84} \end{array}$$

This means that you can give each person 2 tens.



Continue dividing from where you left off.

$$\begin{array}{r} 2 \\ 4 \overline{)84} \\ - 8 \downarrow \\ \hline 04 \end{array}$$

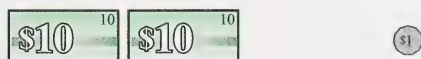
There are 4 ones left to share. You can share 4 ones equally among 4 people.
If you finish the division, this is easy to see.

$$\begin{array}{r} 21 \\ 4 \overline{)84} \\ - 8 \\ \hline 04 \\ - 04 \\ \hline 0 \end{array}$$

Give each person 1 one because $4 \div 4 = 1$.



Each person receives 2 ten-dollar bills and 1 one-dollar coin.



Each of the four people receives \$21.

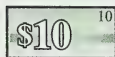
Example

If \$68 is shared equally by 4 people, how much will each person receive?



$$4 \overline{)68} \quad \leftarrow 1 \text{ ten each}$$

Share the ten-dollar bills. Give each person 1 ten



$$\begin{array}{r} 1 \\ 4 \overline{)68} \\ - 4 \\ \hline 28 \end{array}$$

Four people share
4 tens
Trade the 2 tens for 20 ones

20 ones + 8 ones = 28 ones

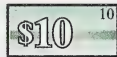
2 tens and 8 ones left to share

Share the one-dollar coins. Give each person 7 ones because $28 \div 4 = 7$.



$$\begin{array}{r}
 4 \text{ people} \rightarrow 4 \overline{) 68} \quad \leftarrow 7 \text{ ones each} \\
 \underline{- 8} \\
 28 \\
 28 \text{ ones} \rightarrow \underline{- 28} \\
 0 \quad \leftarrow \text{No remainder}
 \end{array}$$

Each person receives 1 ten-dollar bill and 7 one-dollar coins.

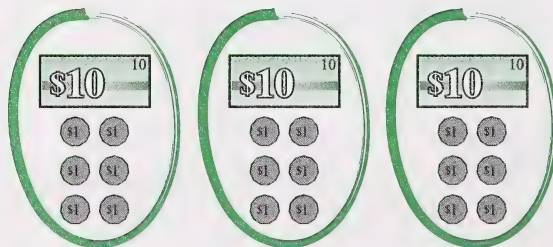


Each of the four people receives \$17.

3. For each of the following questions, redraw the money amounts so that each person gets an equal share. Tell how much is in each share. An example is shown.

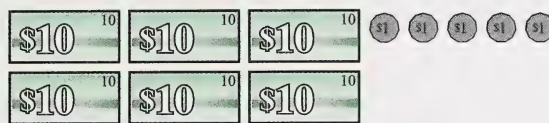
Example

\$48 shared by 3 people



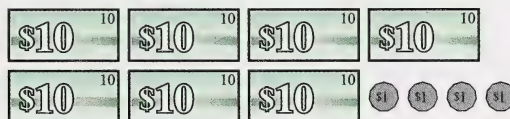
Each share is \$16.

- a. \$65 shared by 5 people



Each share is _____.

- b. \$74 shared by 2 people



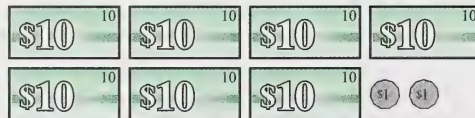
Each share is _____.

c. \$84 shared by 3 people



Each share is _____.

d. \$72 shared by 6 people



Each share is _____.

Check your answers in the Appendix.



Problem Solving



Use the Making a Table problem-solving strategy to find the answer to each of the following problems. You may use your calculator if you wish.

4. Many human body cells are able to multiply or reproduce at incredible speeds. Certain cells in your body can double in 1 second. Pretend you are watching just one cell. If this cell continued to double, how many cells would you have in all after 10 seconds?

Step 1: Understand the problem.

Every second, the number of cells doubles. You must find the total number of cells after 10 seconds.

Step 2: Make a plan. (Choose a strategy.)

Use a table to show what you already know. Maybe a pattern will be shown.

Seconds	1	2	3	4	5	6	7	8	9	10
Number of Cells	2	4	8							

Step 3: Try the plan.

- Fill in the rest of the table with the correct numbers.
- Write your solution to the problem in a complete sentence.

ANSWER TO THE PROBLEM

Step 4: Look back.

- c. Does your sentence answer the question being asked? Explain.

- d. Is your answer reasonable? Explain.

- e. Can you think of another strategy or method you could use to solve the problem?



Check your answers in the Appendix.

5. Elmo and Bart like to challenge each other with number tricks. One day after school, Bart raced to catch up to Elmo.

“Hey, Elmo! I’ve got a really good trick. I bet I can stump you with this one. See if you can guess what number I’m thinking of.”

The boys sat down on the curb, and Elmo pulled out a pencil and some paper. “Okay,” said Elmo, “I’m ready. What’s the question?”

“I’m thinking of a number between 125 and 195. If you count by 5s, you say the number’s name. The number can be divided evenly by 4 and by 8. What’s the number?”

If you were Elmo, how would you solve this problem?

Step 1: Understand the problem.

The problem is asking you to find a number between 125 and 195 that meets three rules:

- You say it when you count by 5s.
- It can be divided evenly by 4.
- It can be divided evenly by 8.

Step 2: Make a plan. (Choose a strategy.)

Since there are several rules to keep track of, you could put the information you find in a table.

Step 3: Try the plan.

The number is between 125 and 195, but you don't have to try every number. You know that the number is said when you count by 5s, so fill in the first row by skip counting by 5.

- a. Count by 5s. Write these numbers in the top line of the table.

Said When Counting by 5s	125														195
Divides Evenly by 4															
Divides Evenly by 8															

Next, you know the number can be divided evenly by 4.

- b. Find the numbers in your table that can be divided by 4 with no remainder. Write these numbers on the second line.

Next, you know the number can be divided evenly by 8.

- c. Find the numbers in your table that can also be divided by 8 with no remainder. (**Hint:** There is only one!) Write this number on the third line.

d. ANSWER TO THE PROBLEM

The number is _____.



Check your answers in the Appendix.

Step 4: Look back.

- e. Did you solve the question being asked in the problem? Explain.

- f. Does your answer make sense? Explain.



Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 14.



Division in Four Steps

In the lesson for Day 14 you used a three-step method of division. Today you will learn a fourth step that is used to solve more difficult problems.

In your solutions you will be using the following four steps:

- Step 1: Estimate
- Step 2: Multiply
- Step 3: Subtract
- Step 4: Bring Down and Regroup

Example

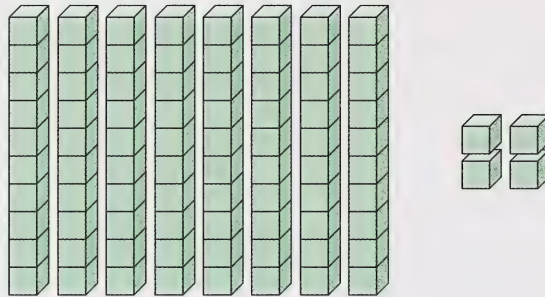
Suppose you have collected 84 large pop bottles in a fund-raising drive held by your club. The bottle depot will only accept the bottles if they are put in boxes with 6 bottles in each box. How many boxes will you need for all your bottles?





Find your base ten blocks and the \times/\div mat.

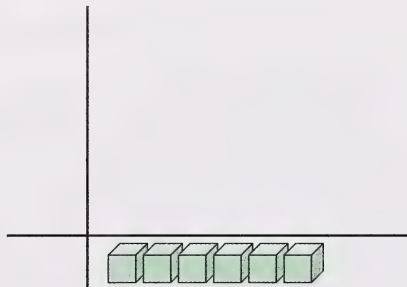
Begin by showing 84 using 8 tens rods and 4 ones cubes. Lay out these blocks on your desktop.



The problem asks you to divide 84 bottles into groups of 6.

If 84 is divided into rows of 6, how many rows will there be?

On your \times/\div mat, place six extra cubes along the horizontal axis to show you are making rows of 6.



Now you are ready to begin the four-step method.

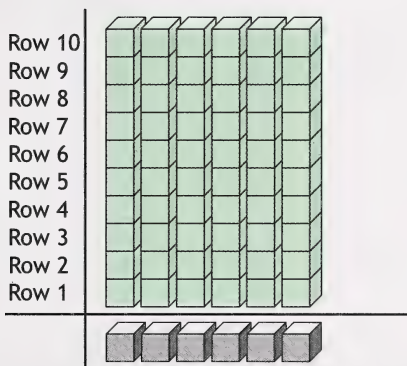
Step 1: Estimate

$$6 \overline{)84}$$

Ask: Can I divide 8 tens by 6?

or

Can I lay a tens rod on the mat six times to make ten rows of 6? Try it and see.



You were able to lay 1 ten rod down six times.

To show this, write 1 above the 8 tens.

$$6 \overline{)84}^1$$

Step 2: Multiply

Multiply: $1 \times 6 = 6$ tens

You used 1 ten 6 times = 6 tens.

Write: Write 6 below the 8.

$$\begin{array}{r} 1 \\ 6 \overline{)84} \\ \underline{6} \end{array}$$

Step 3: Subtract

Think: I had 8 tens and 4 ones. I used 6 tens.

Ask: How many blocks are left?

Subtract:
$$\begin{array}{r} 1 \\ 6 \overline{)84} \end{array}$$

$$\begin{array}{r} - 6 \\ \hline 2 \end{array}$$

There are 2 tens that have not yet been shared.

Step 4: Bring Down and Regroup

$$\begin{array}{r} 1 \\ 6 \overline{)84} \end{array}$$

$$\begin{array}{r} - 6 \downarrow \\ \hline 24 \end{array}$$

Altogether you have 2 tens and 4 ones left.

Regroup: In order to lay the rest of the blocks on the mat in rows of 6, you must trade the 2 tens for 20 ones cubes. Do you know why?



Because you don't have enough tens to lay 1 ten down six times!

After regrouping, you have 24 ones.

Continue the problem by repeating the steps.

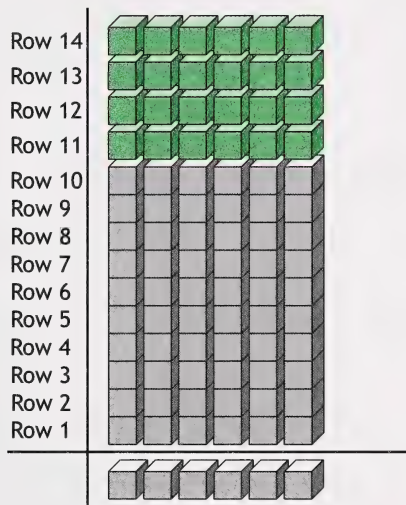
Step 1: Estimate

Ask: Can I divide the remaining 24 ones by 6?

or

Can 24 cubes be put into rows of 6?

Show how you would divide the remaining 24 cubes into rows of 6.



You were able to make four more rows of with 6 ones cubes in each row.

To show this, write 4 above the 4 in 84.

$$\begin{array}{r} 14 \\ 6 \overline{)84} \\ \underline{-6} \\ 24 \end{array}$$

Step 2: Multiply

Multiply: $4 \times 6 = 24$

Four rows of 6 made another rectangle on the mat that used 24 cubes.

Write: Write 24 below 24.

$$\begin{array}{r} 14 \\ 6 \overline{)84} \\ - 6 \\ \hline 24 \\ - 24 \\ \hline 0 \end{array}$$

Step 3: Subtract

Think: I had 24 unit cubes. I used 24 unit cubes.

Ask: How many cubes are left?

$$\begin{array}{r} 14 \\ 6 \overline{)84} \\ - 6 \\ \hline 24 \\ - 24 \\ \hline 0 \end{array}$$



Step 4: Regroup

Write: Write zero below the 4.

Think: No more rows of 6 cubes can be made.

Ask: What does the remainder tell me?

The remainder shows that there are no cubes left over. All cubes were used to make 14 rows of 6 cubes.

The final answer is 14 R0.

$$\begin{array}{r} 14 \text{ R}0 \\ 6 \overline{)84} \\ \underline{-6} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

ANSWER TO THE PROBLEM

You will need 14 boxes for all your bottles.

Here is another example.

$$84 \div 7 =$$

$$\begin{array}{r} 7 \overline{)84} \\ \underline{} \\ \\ \underline{} \\ \\ \underline{} \end{array}$$

Step 1: Estimate

Think: I have 8 tens. I need to make seven rows.

Ask: Can I place the tens on the mat so that there is 1 ten in each row?

Yes. There are enough tens so that 1 ten can be placed in each row.)

Think: I can place 1 ten in each of the seven rows.

Write: Write 1 above the 8 tens.

Step 2: Multiply

$7 \times 1 \text{ ten} = 7 \text{ tens}$

Put 7 below the 8 tens.

$$\begin{array}{r} 1 \\ 7 \overline{)84} \\ - 7 \\ \hline \end{array}$$

Step 3: Subtract

$8 \text{ tens} - 7 \text{ tens} = 1 \text{ ten}$

Put 1 below the 7.

$$\begin{array}{r} 1 \\ 7 \overline{)84} \\ - 7 \\ \hline 1 \end{array}$$

Step 4: Bring Down and Regroup

Think: I have 1 ten and 4 ones left.

This is the same as 14 ones.

Repeat the steps.

$$\begin{array}{r} 1 \\ 7 \overline{)84} \\ - 7 \\ \hline 14 \end{array}$$

Step 1: Estimate

Ask: Can I put 14 cubes into the seven rows.

Yes. You can put 2 more cubes in each row.

Write: Write 2 above the 4 in 84.

$$\begin{array}{r} 12 \\ 7 \overline{)84} \\ - 7 \\ \hline 14 \end{array}$$

Step 2: Multiply

$$7 \times 2 = 14$$

Seven rows of 2 made another rectangle on the mat, which used 14 more cubes.

Put 14 below the 14.

$$\begin{array}{r} 12 \\ 7 \overline{)84} \\ - 7 \\ \hline 14 \\ - 14 \\ \hline 0 \end{array}$$

Step 3: Subtract

$$14 - 14 = 0$$

Write 0 below the 4.

Step 4: Bring Down and Regroup

There are no more cubes to place.

The remainder is 0.

The final answer is 12 R0.

$$\begin{array}{r} 12 \text{ R}0 \\ 7 \overline{)84} \\ - 7 \\ \hline 14 \\ - 14 \\ \hline 0 \end{array}$$

1. a. Solve the following division question. Use your base ten blocks if you wish. Follow the steps in order from (1) to (7).

Estimate (1)

→

$$\begin{array}{r} 8 \overline{) 97} \\ - \\ \hline \end{array}$$

←

(5) Estimate

Subtract (3)

→

$$\begin{array}{r} 8 \overline{) 97} \\ - \\ \hline \end{array}$$

←

(2) Multiply

Subtract (7)

→

$$\begin{array}{r} 8 \overline{) 97} \\ - \\ \hline \end{array}$$

←

(4) Bring Down/Regroup

→

$$\begin{array}{r} 8 \overline{) 97} \\ - \\ \hline \end{array}$$

←

(6) Multiply

- b. Complete the division sentence.

$$97 \div 8 = \underline{\hspace{2cm}}$$

2. Use the four-step method to complete the following division questions.

a.

$$\begin{array}{r} 3 \overline{) 48} \\ - \\ \hline \end{array}$$

$$48 \div 3 = \underline{\hspace{2cm}}$$

b.

$$\begin{array}{r} 5 \overline{) 75} \\ - \\ \hline \end{array}$$

$$75 \div 5 = \underline{\hspace{2cm}}$$

c.

$$\begin{array}{r} 4 \overline{) 57} \\ \underline{} \\ \end{array}$$

$$57 \div 4 = \underline{\hspace{2cm}}$$

d.

$$\begin{array}{r} 3 \overline{) 53} \\ \underline{} \\ \end{array}$$

$$53 \div 3 = \underline{\hspace{2cm}}$$

e.

$$\begin{array}{r} 3 \overline{) 87} \\ \underline{} \\ \end{array}$$

$$87 \div 3 = \underline{\hspace{2cm}}$$

f.

$$\begin{array}{r} 4 \overline{) 96} \\ \underline{} \\ \end{array}$$

$$96 \div 4 = \underline{\hspace{2cm}}$$

Check your answers in the Appendix.



3. Use the four-step method to solve the following problems.

- a. Nick found 27 socks in his sock drawer. How many pairs of socks can he make?



- b. Dirk wants to buy some model car kits. Each one costs \$7. How many kits can he buy for \$88?

- c. Seventy-two children signed up to play basketball. They have to be divided into teams of 5. How many teams can be made?

- d. Sally made treat bags for her party. She put 90 candies in 6 bags. How many candies did she put in each bag if she shared the candies equally?



Check your answers in the Appendix.





Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you are still having difficulty with the four-step method for division.

If you choose **not** to do the questions at this time, you may wish to return here later to review division of money before completing the review activities for Day 16.

Sharing Dimes and Pennies

Alan, Bill, and Colleen have 78¢ to share (seven dimes and eight pennies). If the money is shared equally, how much will each person receive?

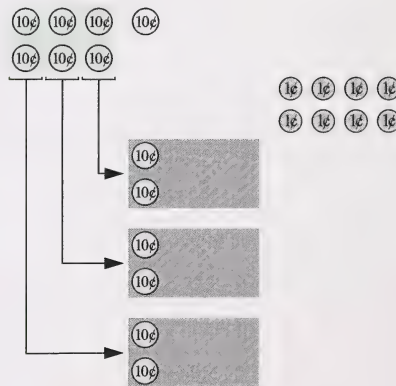
To divide $3 \overline{)78}$, follow the three steps.

Step 1: Divide 7 by 3. (Share the dimes three ways.)

$$\begin{array}{r} 2 \\ 3 \overline{)78} \\ - 6 \\ \hline 18 \end{array}$$

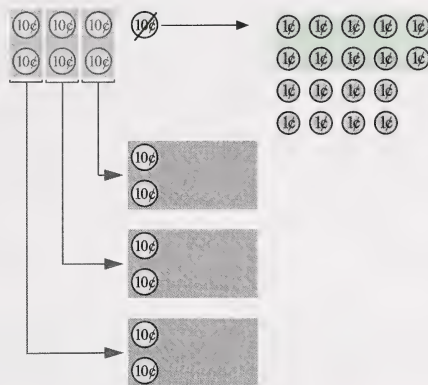
← Each person gets two dimes.

← One dime and eight pennies are still left to be shared.



Step 2: Trade the dime for ten pennies.

$$10 \text{ pennies} + 8 \text{ pennies} = 18 \text{ pennies}$$

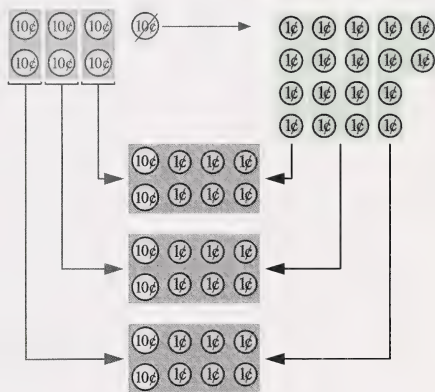


Step 3: Divide 18 by 3. (Share the pennies three ways.)

$$\begin{array}{r} 26 \\ 3 \overline{) 78} \\ \underline{- 6} \\ 18 \\ \underline{- 18} \\ 0 \end{array}$$

Each person gets six pennies as well.

No remainder (All the money has been shared.)

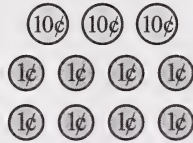


ANSWER TO THE PROBLEM

Each person will receive 26¢.

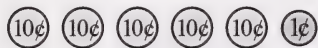
4. For each of the following money amounts, draw how much money each person will receive. Then write the shared amount in the blank.

- a. 38¢ shared by 2 people



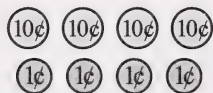
Each person will receive _____.

- b. 51¢ shared by 3 people



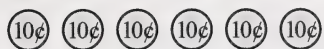
Each person will receive _____.

- c. 44¢ shared by 4 people



Each person will receive _____.

- d. 60¢ shared by 5 people



Each person will receive _____.

Check your answers in the Appendix.

5. Divide each of the following. Think of dimes and pennies.

a. $3 \overline{)42}$

b. $4 \overline{)68}$

c. $2 \overline{)70}$

d. $5 \overline{)75}$

Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 15.





More Ways to Check Quotients

Special Divisors

There are certain division sentences that are very easy to solve.

- Any number divided by 1 equals the number.
- Numbers ending in zeros can be quickly divided by 10, 100, or 1000 by dropping zeros.
- Zero divided by any number equals zero.

Another kind of division problem can also be solved quickly in your head.



A number divided by itself equals 1.

Example

$$14 \div 14 =$$

You already know that multiplication can help you solve division problems. Turn this problem around.

What number multiplied by 14 will give you 14?

$$\quad \times 14 = 14$$

You know that the answer is 1 because any number times 1 equals that same number.

$$14 \div 14 = 1$$

Many other division sentences work this way. Some examples are:

$$24 \div 24 = 1$$

$$74 \div 74 = 1$$

$$45 \div 45 = 1$$

$$86 \div 86 = 1$$

$$69 \div 69 = 1$$

$$100 \div 100 = 1$$

Remember that any number divided by itself equals 1. You will be able to solve problems quickly in your head without using pencil and paper or a calculator.

1. Answer the following division questions by solving them quickly in your head. Remember how to recognize the special divisors you have learned about in this module.

a. $18 \div 18 =$ _____

b. $34 \div 34 =$ _____

c. $28 \div 1 =$ _____

d. $49 \div 49 =$ _____

e. $0 \div 6 =$ _____

f. $52 \div 1 =$ _____

g. $16 \div 16 =$ _____

h. $0 \div 38 =$ _____

i. $72 \div 72 =$ _____

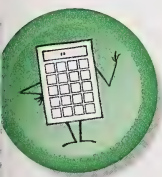
j. $99 \div 1 =$ _____

Check your answers in the Appendix.

Using a Calculator to Check Answers

In Day 10 you learned ways to check your answers to division problems using multiplication.

There are times when you might wish to use your calculator to check your answers to division problems.



Example

$$61 \div 8 =$$

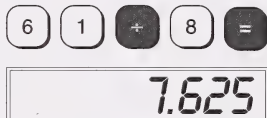
By using the method you practised in Day 13, you will arrive at the following quotient:

$$\begin{array}{r} 7 \\ 8 \overline{)61} \\ - 56 \\ \hline 5 \end{array}$$



The solution is $61 \div 8 = 7 \text{ R}5$.

What happens when you check this answer with your calculator? Make sure you have cleared any numbers that may be showing on the calculator display. When you enter $61 \div 8 =$, the following answer appears:



This answer looks strange! It does not match your answer of 7 R5.

Your Answer
 $61 \div 8 = 7 \text{ R}5$

Calculator Answer
7.625

However, you will notice that both answers start with the number 7. This means that both solutions agree on at least part of the answer, and you already know that 8×7 is 56, which is close to 61. Both answers must be *close* to the right answer.



The second part of the calculator answer begins with a decimal. This tells you that the numbers after the **decimal point** are a part or a fraction of a whole number.

Decimal point → **7.625** ← Part of a whole number

The number 7.625 really means that answer is 7 and a little bit more.

The calculator's answer of 7.625 seems similar to your answer of 7 R5, but you can't be sure if the two answers are exactly the same. It is difficult to compare the two results. Using a calculator may not be a great way to check answers to all division problems. You need to know more about decimal numbers first. However, it is not necessary for you to learn any more about decimal numbers until later grades.

What you should know is this:

- It is difficult to check your answer to division problems on a calculator when you are dealing with remainders. Your answer and the calculator answer will not always look the same!
- When you have no remainders to worry about, you may find it useful to check your answer with a calculator.





2. Show how you would divide to find the answer to each of these questions. Write your answer in the first space. Then write the calculator answer in the second space.

a. $4 \overline{)23}$

b. $6 \overline{)36}$

$23 \div 4 =$ _____

$36 \div 6 =$ _____

Calculator answer: _____

Calculator answer: _____

c. $5 \overline{)72}$

d. $8 \overline{)43}$

$72 \div 5 =$ _____

$43 \div 8 =$ _____

Calculator answer: _____

Calculator answer: _____

e. $500 \div 10 =$ _____

f. $8000 \div 100 =$ _____

$500 \div 10 =$ _____

$8000 \div 100 =$ _____

Calculator answer: _____

Calculator answer: _____



Check your answers in the Appendix.



As you worked on the previous questions, did you notice how long it took you to do the questions that had no remainders? Could you finish them quicker in your head than on the calculator?

Did you know answers to any of the other questions without having to use pencil and paper or the calculator?

Using the calculator is not always the quickest way to find an answer to a question.

- Basic facts can be done quicker in your head.
 - Dividing by 1, 10, 100, and 1000 can be done quicker in your head.
 - Dividing zero by a number and dividing a number by itself can be done quicker in your head.
3. Decide if these questions can be completed quicker in your head or with pencil and paper (or a calculator). Rewrite the division sentences in the correct category or box.

$15 \div 15 =$	$24 \div 1 =$	$3100 \div 100 =$
$52 \div 7 =$	$0 \div 64 =$	$97 \div 5 =$
$760 \div 10 =$	$35 \div 3 =$	$68 \div 9 =$

These Questions Should Be Done in My Head	These Questions Should Be Done with Pencil and Paper or with a Calculator

4. Three boys were packing pop bottles in cartons. Each carton holds 6 bottles. Sam packed 79 pop bottles. Neil packed 51. Dan packed 62.
- a. How many full cartons did each boy have?



- b. Are there enough leftover bottles to fill another carton? Explain.

Check your answers in the Appendix.



Basic Number Facts Practice



Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

Basic Number Facts Practice

Division Number Facts

Number Completed in 2 Minutes _____


Number Correct in 2 Minutes _____

Multiplication Number Facts

Number Completed in 2 Minutes _____

Number Correct in 2 Minutes _____

Record your score on the Number Facts Progress Chart.

A cartoon character with a large head, wearing a wizard's hat and a square body, pointing its right arm towards the text.

5. Division Number Facts

Timed Exercise: 2 minutes

$$8 \overline{)72}$$

$$9 \overline{)45}$$

$$9 \overline{)36}$$

$$6 \overline{)54}$$

$$7 \overline{)49}$$

$$64 \div 8 =$$

$$35 \div 5 =$$

$$27 \div 9 =$$

$$40 \div 8 =$$

$$48 \div 8 =$$

$$4 \overline{)36}$$

$$8 \overline{)24}$$

$$5 \overline{)20}$$

$$8 \overline{)32}$$

$$9 \overline{)18}$$

$$42 \div 7 =$$

$$48 \div 6 =$$

$$56 \div 7 =$$

$$15 \div 5 =$$

$$24 \div 4 =$$

$$7 \overline{)21}$$

$$6 \overline{)30}$$

$$6 \overline{)36}$$

$$7 \overline{)63}$$

$$7 \overline{)28}$$



Check your answers in the Appendix.



6. Multiplication Number Facts

Timed Exercise: 2 minutes

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$$

$9 \times 3 =$

$8 \times 3 =$

$8 \times 8 =$

$5 \times 9 =$

$5 \times 8 =$

$$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$$

$2 \times 9 =$

$5 \times 5 =$

$7 \times 7 =$

$3 \times 5 =$

$4 \times 8 =$

$$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$$



Check your answers in the Appendix.

Turn to Assignment Booklet 6B, and complete the activities for Day 16.





Putting It All Together (II)

In Section 2 you learned more about division and continued to practise the skills you learned in Section 1. There are some important things for you to remember:

- Calculations for division problems follow certain steps or procedures.
- You can check the answers to division problems by multiplying.
- Calculators can sometimes be used to check division answers.
- Calculators are not always the fastest way to solve a problem.
- Looking for clue words in a story problem helps you choose the correct operation to solve it.
- Cancelling out common zeros is helpful when dividing by 10, 100, or 1000.
- A number divided by itself always equals 1.
- Dividing a number by zero is impossible.

Knowing how to divide quickly and accurately is important. You will use your division skills in other modules in Mathematics 4, and you will learn more about division in future grades.

Today you will show what you have learned about division by completing several review questions. Then you will complete a Challenge Activity related to the activities you have been working on in Section 2.

Part 1: Reviewing the Concepts

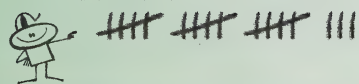
For Part 1 you will complete all of the review questions for Day 17 in Assignment Booklet 6B. First, you may wish to look back through the Student Module Booklet to review the concepts covered in Section 2.

Part 2: Challenge Activities

The Challenge Activities in Part 2 are designed to extend the ideas you have been learning about and encourage you to explore new ideas about division. In Assignment Booklet 6B, you will find two Challenge Activities. Complete **either** Activity A **or** Activity B (or you may do both if you wish).

Turn to Assignment Booklet 6B, and complete the review activities in Part 1. Then do one or both of the Challenge Activities in Part 2.





Assessing What You Know (II)



This is the last day you will be working on Section 2.

Today you will complete three activities in Assignment Booklet 6B:

- Showing What You Can Do
- Basic Number Facts
- Thinking About What You Know

Read the explanation of the activities in Parts 1, 2, and 3 before turning to Assignment Booklet 6B. Note that you will need the help of your home instructor for the activities in Parts 1 and 2.

Part 1: Showing What You Can Do



For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions like the following:

- “How do you know that?”
- “Why did you decide to do that?”
- “How did you get that answer?”

Your job is to explain what you are doing so that your home instructor can understand your thinking.



Note to the Home Instructor

This performance assessment should take about 15 minutes. The Home Instructor’s Assessment Page and accompanying Student’s Assessment Page can be found in Day 18 of Assignment Booklet 6B. Remove both pages from the Assignment Booklet. Read over the student’s page so you are familiar with the student’s assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem.** You may or may not wish to use some of the interview questions. Look for understanding and the student’s ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

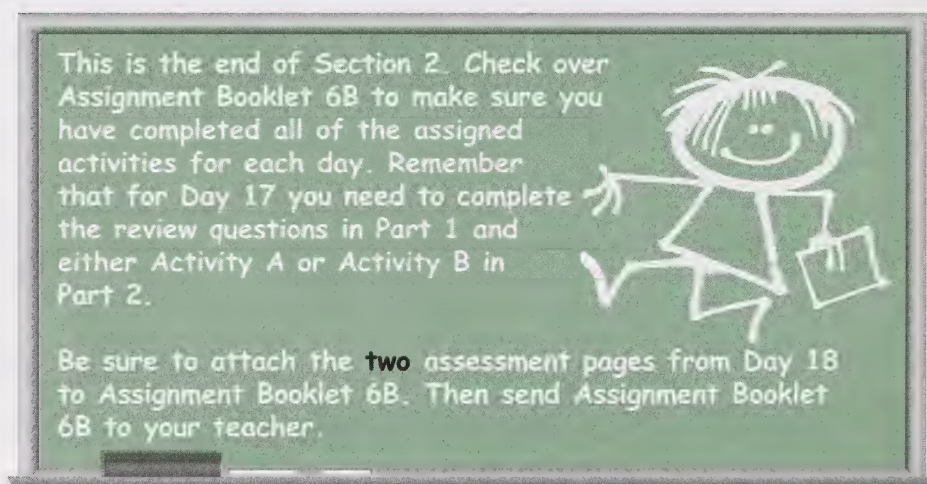
Part 2: Basic Number Facts

In this activity you will show how well you are learning your basic number facts for multiplication and division. Ask your home instructor to time you as you do each test.

Part 3: Thinking About What You Know

In this activity you will spend a few minutes looking back over Days 1 to 16 of the Student Module Booklet. Then you will complete some statements about things you liked, things you didn't understand, and things you would like to learn more about. Your teacher will find this useful in determining how well you understood the information in the module.

When your home instructor is ready, turn to Assignment Booklet 6B and complete the activities found in Parts 1, 2, and 3 of Day 18.





Appendix

Glossary

Answer Key to Self-Marking Activities

Cut-Out Learning Aids

Number Facts Progress Chart



Glossary

array: a group of objects arranged in rows and columns

Each row will have the same number of objects. Each column will have the same number of objects.

decimal point: a dot that separates the ones and tenths places in a decimal number

For example, in the number 5.8, the decimal point separates the whole number 5 from the portion 8 tenths. The entire number can be read as five and eight tenths.

dividend: the total number of items to be divided

For example, in $12 \div 3 = 4$, 12 is the dividend.

division: the process of sharing or grouping a number of items into smaller groups

A division sentence can be written two ways.

$$12 \div 3 = 4 \text{ or } 3 \overline{)12}^4$$

divisor: a number by which another number is to be divided

For example, in $12 \div 3 = 4$, 3 is the divisor.

estimate: to make a careful guess that is close to the actual value without calculating the value exactly

multiple: the number you get when you multiply a given number by 1, 2, 3, 4, 5, and so on

For example, 16 is a multiple of 8 because 8 can be multiplied by 2 to get 16.

multiplication: taking a number and adding it to itself a certain number of times

For example, in the number sentence $4 \times 5 = 20$, you are adding a group of five items four times or $5 + 5 + 5 + 5 = 20$.

product: the number arrived at when two or more numbers are multiplied

In the number sentence $4 \times 5 = 20$, 20 is the product.

quotient: the number obtained by dividing one number by another

For example, in $12 \div 3 = 4$, 4 is the quotient.

related fact: a number fact that can be considered part of a family of facts

Because multiplication and division are inverse operations, these facts are all related:

- $4 \times 5 = 20$
- $5 \times 4 = 20$
- $20 \div 4 = 5$
- $20 \div 5 = 4$

Because addition and subtraction are also inverse operations, you can say that these facts are related:

- $4 + 5 = 9$
- $5 + 4 = 9$
- $9 - 5 = 4$
- $9 - 4 = 5$

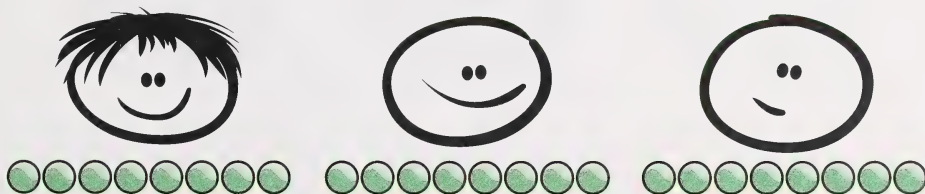
remainder: the number left over when a number cannot be evenly divided

For example, the problem $13 \div 3$ will result in 4 smaller groups but 1 will be left over. This 1 is called the remainder. (The remainder is not enough to make another group.)

Answer Key to Self-Marking Activities

Day 1: What Does Division Mean?

1. Your drawing might look like this.



2. $24 \div 3 = 8$

3. Each person will receive **eight marbles**.

4. Your drawing might look like this.



5. $24 \div 4 = 6$

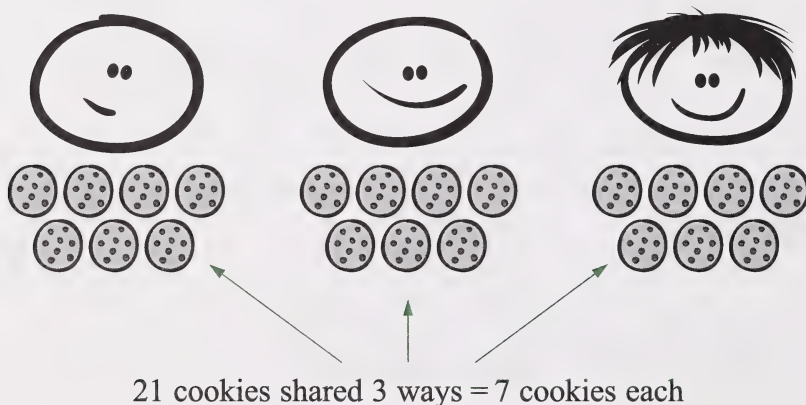
6. Each person will receive **six marbles**.

7. a. You should have included the word “share” in your problem. You need to end the problem with a question. A sample sharing division problem follows. Your answer should be similar to the sample.

I was asked to share a bag of cookies with my brother and sister. There were 21 cookies in the bag. How many did each of us get?

b. Solution: $21 \div 3 = 7$

c. Your sketch should be similar to the one shown here.



d. Sentence answer: Each person got seven cookies.

8. a. A sample problem has been provided for you. Your solution should have the same number answer. Your sentence answer will likely be different. You should include the word “share” in your story problem. Your problem must end with a question and a question mark.

Mr. Smithson, the manager of a tree nursery, gave 45 free spruce trees to the new homeowners near his nursery. There were 9 homeowners to share the trees. How many trees did each homeowner get from Mr. Smithson?

b. Solution: $45 \div 9 = 5$

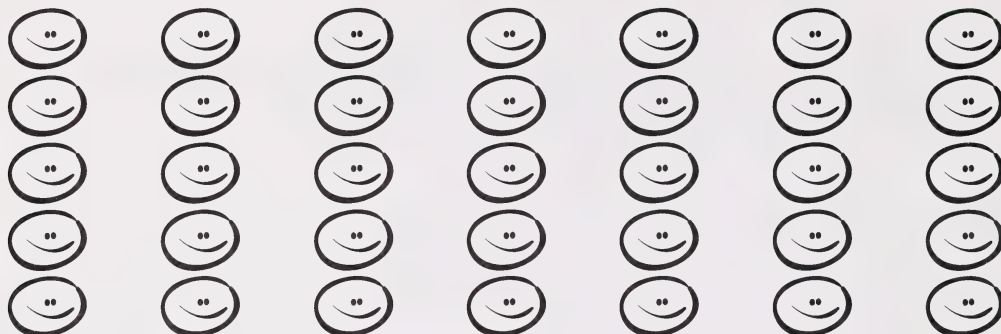
- c. Your drawing should show 45 objects shared by nine people or groups.



- d. Sentence answer: Each homeowner got five trees from Mr. Smithson.

Day 2: Another Way to Look at Division

1. a. Your drawing should be similar to the one shown below.



b. $35 \div 5 = 7$

- c. Seven basketball teams can be made.

2. a. Your drawing should be similar to the one shown.



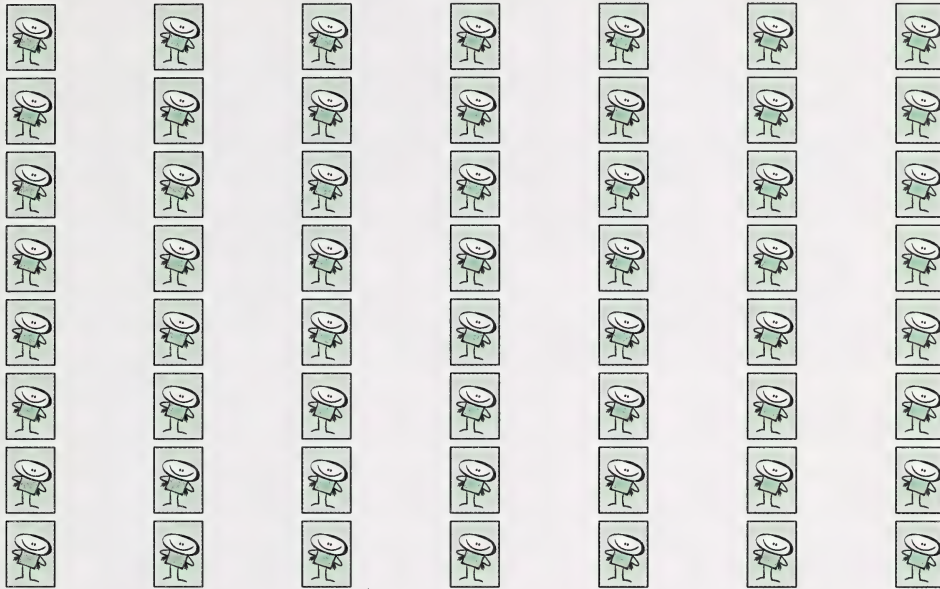
b. $30 \div 10 = 3$

- c. Three vans would be needed to carry 30 players.

3. a. Calvin was sorting out his **collector cards**. He decided to put the 56 cards into groups of 8 so that they would fit into the pages of his card collector's **album**. How many pages will he need?

b. Solution: $56 \div 8 = 7$

Your drawing might look like this. You may have arranged your cards differently, but there should be eight cards in each group.



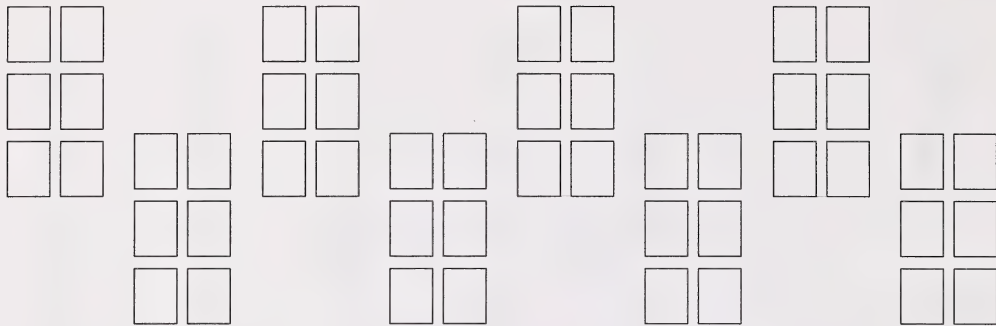
c. Sentence answer: Seven pages are needed for the album.

4. a. Your problem will not be exactly the same as the following example, but it should be similar. It should end with a question and a question mark.

Joey was recycling paper by constructing booklets to be used as notepads by his Scout troop. He had 48 sheets of paper and was told to put 6 pages in each booklet. How many booklets will he be able to make?

b. Solution: $48 \div 6 = 8$

Your drawing should be similar to this.



c. Sentence answer: Joey can make eight booklets.

5. a. 6 coops of chickens

b. 7 trains

c. 7 cartons of books

d. 5 teams

Day 3: Reveiwing the Basic Division Facts

- | | | |
|---------|------|-------|
| 1. a. 5 | b. 6 | c. 7 |
| d. 4 | e. 3 | f. 10 |
| g. 9 | h. 8 | i. 4 |
| j. 2 | k. 6 | l. 7 |
| m. 6 | n. 3 | o. 9 |

2. Your goal is to pick out the cards as fast as you can. You should have found eight cards. Your answer should tell the time it took you to pick out the selected cards. There is no wrong answer.

$16 \div 4$	$12 \div 3$	$8 \div 2$	$36 \div 9$	$32 \div 8$	$20 \div 5$	$24 \div 6$	$28 \div 7$
-------------	-------------	------------	-------------	-------------	-------------	-------------	-------------

3. You should have found eight flash cards with an answer of 2.

$4 \div 2$

$6 \div 3$

$8 \div 4$

$10 \div 5$

$12 \div 6$

$14 \div 7$

$16 \div 8$

$18 \div 9$

4. You should have found eight flash cards with an answer of 3.

$6 \div 2$

$9 \div 3$

$12 \div 4$

$15 \div 5$

$18 \div 6$

$21 \div 7$

$24 \div 8$

$27 \div 9$

5. You should have found eight flash cards with an answer of 6.

$12 \div 2$

$18 \div 3$

$24 \div 4$

$30 \div 5$

$36 \div 6$

$42 \div 7$

$48 \div 8$

$54 \div 9$

6. Division Number Facts

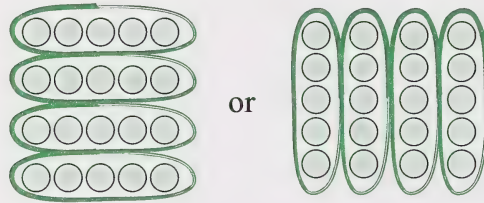
4	7	4	5	5
4	6	9	8	3
9	9	5	4	6
3	3	5	4	3
7	8	6	2	7

7. Multiplication Number Facts

18	27	45	28	18
21	7	32	15	40
25	42	35	24	28
36	40	25	21	16
18	36	18	24	30

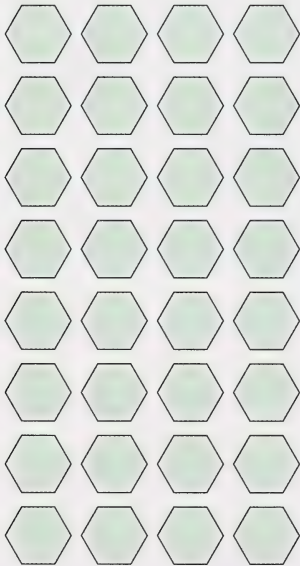
Day 4: Multiplication and Division Are Related

1. The array for $20 \div 4 = 5$ is the same array as for $4 \times 5 = 20$.



2. • $3 \times 7 = 21$ • $21 \div 7 = 3$
• $7 \times 3 = 21$ • $21 \div 3 = 7$

3. a. Your array should be similar to the one shown.



- b. • $32 \div 8 = 4$ • $8 \times 4 = 32$
• $32 \div 4 = 8$ • $4 \times 8 = 32$

4. a. $16 \div 2 = 8$

b. $8 \times 3 = 24$

c. $12 \div 4 = 3$

5. a. 5

b. 4

c. 6

d. 6

e. 9

f. 4

g. 9

h. 8

i. 8

6. a. $35 \div 5 = 7$

b. $72 \div 9 = 8$

c. $4 \overline{)28}^7$

7. a. $42 \div 6 = 7$

b. $30 \div 5 = 6$

c. $8 \overline{)40}^5$

8. a. $27 \div 9 = 3$

b. $5 \overline{)45}^9$

c. $7 \overline{)56}^8$

9. a. 4

b. 6

c. 42

d. 28

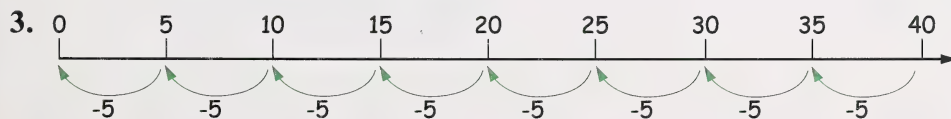
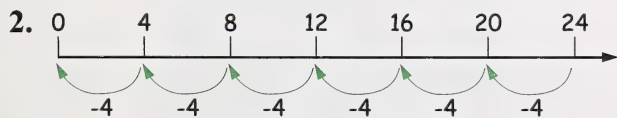
e. 56

f. 389

g. 277

h. 999

Day 5: Stepping Into Division



4. a. 45, 40, 35, 30, 25, 20, 15, 10, 5

b. 27, 24, 21, 18, 15, 12, 9, 6, 3

c. 54, 48, 42, 36, 30, 24, 18, 12, 6

d. 18, 16, 14, 12, 10, 8, 6, 4, 2

e. 63, 56, 49, 42, 35, 28, 21, 14, 7

5. a. 70, 60, 50, 40, 30, 20, 10

Division sentence: $70 \div 10 = 7$

b. 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2

Division sentence: $22 \div 2 = 11$

c. 49, 42, 35, 28, 21, 14, 7

Division sentence: $49 \div 7 = 7$

6. a. Your fishing story needs to tell about 26 things (e.g., fish, fish hooks, worms used for bait, kilograms of fish, \$26 prize money) being shared by two people. The people in the story need names. A sample answer is provided.

Mica and Gena were fishing on Lake Anna last weekend. When they arrived back home, they had caught a total of 26 fish. If they shared these fish equally, how many fish did each of them get to keep?



c. Division sentence: $26 \div 2 = 13$

7. a. $590 \div 10 = 59$ b. $240 \div 10 = 24$
 c. $940 \div 10 = 94$ d. $310 \div 10 = 31$
 e. $290 \div 10 = 29$ f. $650 \div 10 = 65$
8. a. $6800 \div 10 = 680$ b. $2900 \div 10 = 290$
 c. $5500 \div 10 = 550$ d. $6300 \div 10 = 630$
9. a. $200 \div 10 = 20$ b. $4800 \div 100 = 48$
 c. $7300 \div 100 = 73$ d. $6900 \div 10 = 690$
 e. $3000 \div 10 = 300$ f. $8000 \div 100 = 80$

Day 6: Problem Solving

1. **Thirty** apples were sold if \$6.25 was collected by the end of the day.

Number of Apples	6	12	18	24	30
Cost	\$1.25	\$2.50	\$3.75	\$5.00	\$6.25

2. **Forty-eight** apples were sold if \$10.00 was collected by the end of the day.

Number of Apples	24	30	36	42	48
Cost	\$5.00	\$6.25	\$7.50	\$8.75	\$10.00

3. One hundred twenty apples were sold if \$25.00 was collected by the end of the day.

Number of Apples	48	96	102	108	114	120
Cost	\$10.00	\$20.00	\$21.25	\$22.50	\$23.75	\$25.00

4. Jamie and Kim play ball together 4 times in 20 days.

Days	11	12	13	14	15	16	17	18	19	20
Jamie's Games	X		X		X		X		X	
Kim's Games			X			X			X	



5. Division Number Facts

9	7	4	9	8
8	6	3	8	8
9	7	5	4	8
7	6	7	4	4
3	8	6	9	7

6. Multiplication Number Facts

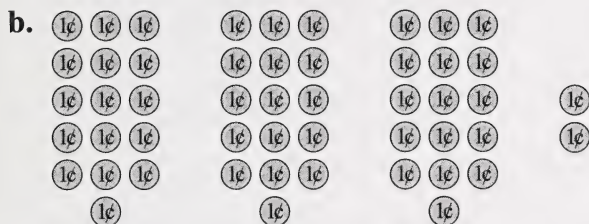
48	27	45	12	18
81	21	32	15	40
25	42	35	63	54
18	40	56	21	16
49	36	72	24	24

Day 7: What About the Leftovers?

1. a. Division sentence: $50 \div 2 = 25$

b. There is no remainder.

2. a. Division sentence: $50 \div 3 = 16 \text{ R}2$



c. There is a remainder. The remainder is 2.

3. a. Division sentence: $50 \div 5 = 10$

b. There is no remainder.

4. a. $29 \div 6 = 4 \text{ R}5$

No, the remainder (softballs) can't be divided again.

b. $20 \div 8 = 2 \text{ R}4$

No, the remainder (cartons) can't be divided again unless the leftover cartons are opened and the milk is then shared.

c. $33 \div 5 = 6 \text{ R}3$

No, the remainder (toys) can't be divided again.

d. $17 \div 4 = 4 \text{ R}1$

Yes, the remainder (rope) can be divided again. Each piece of rope for each cowboy can be made slightly longer. Each cowboy would get $4\frac{1}{4}$ m of rope.

5. a. Division sentence: $73 \div 6 =$

b. $73 - 6 = 67$

$67 - 6 = 61$

$61 - 6 = 55$

$55 - 6 = 49$

$49 - 6 = 43$

$43 - 6 = 37$

$37 - 6 = 31$

$31 - 6 = 25$

$25 - 6 = 19$

$19 - 6 = 13$

$13 - 6 = 7$

$7 - 6 = 1$

c. You subtracted 6 from 73 a total of 12 times.

d. $73 \div 6 = 12 \text{ R}1$

e. Martina can fill 12 cartons with 73 bottles. She will have 1 bottle left over.

Day 8: Putting It All Together (I)

Complete the Day 8 activities in Assignment Booklet 6A. This work will be marked by your teacher.

Day 9: Assessing What You Know (I)

Complete the Day 9 activities in Assignment Booklet 6A. This work will be marked by your teacher.

Day 10: Working with Remainders

1. $4 \times 8 = 32$ or $8 \times 4 = 32$

2. a. $7 \overline{)28}^4 \quad 7 \times 4 = 28 \quad \text{or} \quad 4 \times 7 = 28$

b. $4 \overline{)24}^6 \quad 4 \times 6 = 24 \quad \text{or} \quad 6 \times 4 = 24$

c. $6 \overline{)48}^8 \quad 6 \times 8 = 48 \quad \text{or} \quad 8 \times 6 = 48$

d. $9 \overline{)54}^6 \quad 9 \times 6 = 54 \quad \text{or} \quad 6 \times 9 = 54$

e. $8 \overline{)56}^7 \quad 8 \times 7 = 56 \quad \text{or} \quad 7 \times 8 = 56$

3. $4 \overline{)38}$

4. No.

5. $4 \times 9 = 36$

6. $4 \overline{)38}^9$

7. $4 \times 9 = 36$

$$\begin{array}{r} 9 \\ 4 \overline{)38} \\ - 36 \\ \hline 2 \end{array}$$

8. The remainder is 2.

9. The remainder shows that there will be two sheep left over after nine sheep are put into each of the four pens.

10. a.
$$\begin{array}{r} 3 \text{ R}2 \\ 7 \overline{)23} \\ - 21 \\ \hline 2 \end{array}$$

b.
$$\begin{array}{r} 2 \text{ R}3 \\ 8 \overline{)19} \\ - 16 \\ \hline 3 \end{array}$$

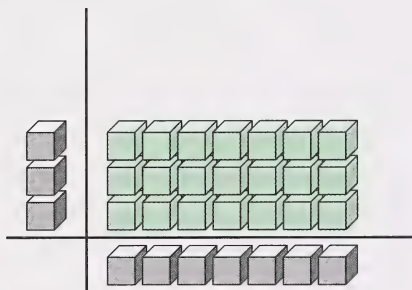
c.
$$\begin{array}{r} 5 \text{ R}2 \\ 6 \overline{)32} \\ - 30 \\ \hline 2 \end{array}$$

d.
$$\begin{array}{r} 5 \text{ R}1 \\ 8 \overline{)41} \\ - 40 \\ \hline 1 \end{array}$$

11. The 24 cubes are placed in six equal rows. This results in six rows with four cubes in each row. In other words, 24 pencils can be placed in six rows of four pencils each.

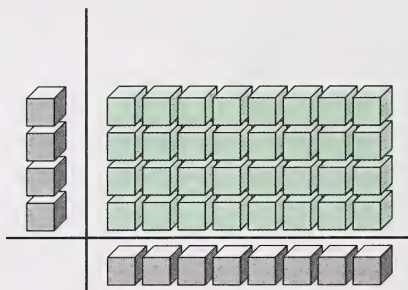
12. Each student received four pencils.

13. a.



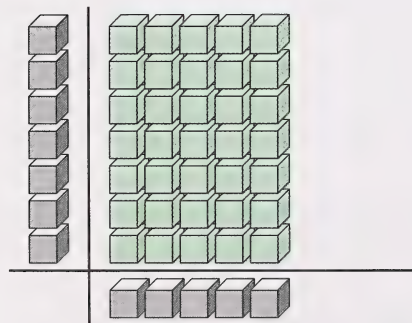
Number in each row: 7

b.



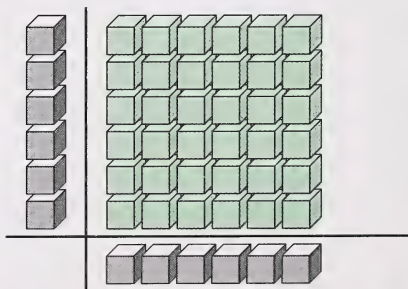
Number in each row: 8

c.



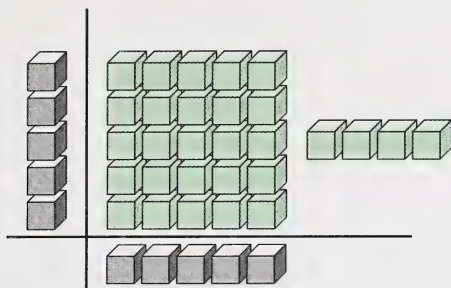
Number in each row: 5

d.



Number in each row: 6

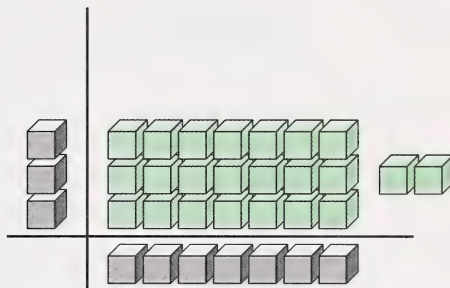
14. a.



Number in each row: 5

Number left over (remainder): 4

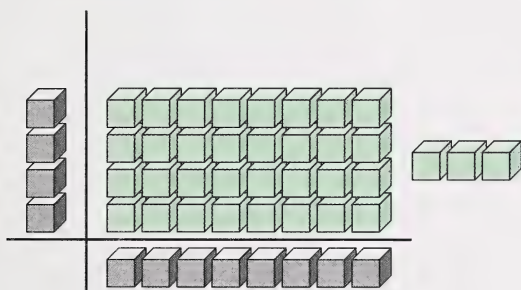
b.



Number in each row: 7

Number left over (remainder): 2

15. a. Your block arrangement should look like this:



b. 4 rows

c. 8 blocks in each row

d. Yes. 3 blocks

e. The leftover blocks tell you that 35 cannot be divided evenly by 4. There is a remainder of 3.

f. For the teams to be equal, only eight students would be on each team. There would be three students leftover who would not be on any team.

If the teams do not need to be equal, then each of three extra students could be assigned to a different team. This would mean there would be three teams with nine students and one team with eight students.

16.

$$\begin{array}{r} 8 \text{ R}4 \\ 5 \overline{) 44} \\ \underline{- 40} \\ 4 \end{array}$$

ANSWER TO THE PROBLEM

Trevor can write his name about eight times in 44 seconds.

17. Division sentence: $25 \div 4 =$

$$\begin{array}{r} \text{Solution: } 6 \text{ R}1 \\ 4 \overline{) 25} \\ \underline{- 24} \\ 1 \end{array}$$

ANSWER TO THE PROBLEM

The group spent **about** 6 minutes on each dance.

18. Division sentence: $55 \div 6 =$

$$\begin{array}{r} \text{Solution: } 9 \text{ R}1 \\ 6 \overline{) 55} \\ \underline{- 54} \\ 1 \end{array}$$

ANSWER TO THE PROBLEM

One cookie costs **about** 9¢.

19. Division sentence: $34 \div 6 =$

$$\begin{array}{r} \text{Solution: } 6 \overline{)34} \quad \text{R4} \\ - 30 \\ \hline 4 \end{array}$$

ANSWER TO THE PROBLEM

Six boxes of gloves need to be ordered.

20. Division sentence: $28 \div 8 =$

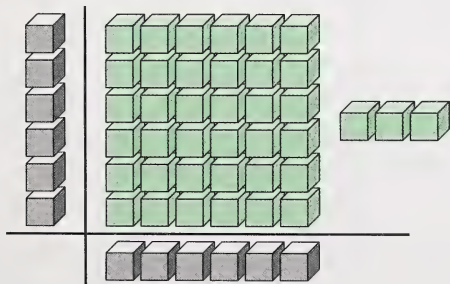
$$\begin{array}{r} \text{Solution: } 8 \overline{)28} \quad \text{R4} \\ - 24 \\ \hline 4 \end{array}$$

ANSWER TO THE PROBLEM

Phillip needs to buy four boxes of cones.

Day 11: Checking the Answer

1. Your answer should show six rows of six cubes with three cubes left over.



2. a. $26 \div 4 = 6 \text{ R}2$

Check: $4 \times 6 = 24$

\downarrow
 $24 + 2 = 26$

The division sentence, $26 \div 4 = 6 \text{ R}2$, is **correct**.

b. $50 \div 6 = 8 \text{ R}3$

Check: $6 \times 8 = 48$

\downarrow
 $48 + 3 = 51$

The division sentence, $50 \div 6 = 8 \text{ R}3$, is **not correct**.

c. $33 \div 7 = 5 \text{ R}2$

Check: $7 \times 5 = 35$

\downarrow
 $35 + 2 = 37$

The division sentence, $33 \div 7 = 5 \text{ R}2$, is **not correct**.

3. a. $19 \div 4 = 4 \text{ R}3$

Related multiplication fact: $4 \times 4 = 16$

$\downarrow \quad \downarrow \quad \downarrow$
Check: $4 \times 4 = 16 + 3 = 19$

b. $29 \div 3 = 9 \text{ R}2$

Related multiplication fact: $3 \times 9 = 27$

$\downarrow \quad \downarrow \quad \downarrow$
Check: $3 \times 9 = 27 + 2 = 29$

c. $42 \div 5 = 8 \text{ R}2$

Related multiplication fact: $5 \times 8 = 40$

Check: $5 \times 8 = 40 + 2 = 42$

d. $70 \div 9 = 7 \text{ R}7$

Related multiplication fact: $9 \times 7 = 63$

Check: $9 \times 7 = 63 + 7 = 70$

4. a. 50 b. 700
c. 900 d. 700
e. 30 f. 60

5. Multiplication Number Facts

20	40	36	48	25
36	40	12	35	45
18	42	32	21	30
18	24	49	28	24
36	32	45	48	27

6. Division Number Facts

6	5	3	9	5
7	7	6	6	5
8	7	7	4	5
6	8	8	4	5
6	2	9	4	3

Day 12: Deciding Which Operation To Use

1. a. addition (Add all the different amounts of trees together.)
b. multiplication (seven groups of eight cards)

- c. multiplication (nine bags worth 25¢ each)
 d. addition (Add all the different rainfall amounts together.)

2. a. subtraction b. division
 c. subtraction d. division

3. a. 500
 b. 60
 c. The remaining four answers should be filled in as shown in the table.

	$\times 10$	$\times 100$
50	500	5000
6	60	600
56	560	5600

4.

	$\times 10$	$\times 100$
70	700	7000
8	80	800
78	780	7800

5.

	$\times 10$	$\times 100$
40	400	4000
5	50	500
45	450	4500

6. You may have noticed one or more of the following patterns:

- Each number in the $\times 10$ column has **one** more zero than the number in the first column.
- Each number in the $\times 100$ column has **two** more zeros than the number in the first column.
- Each number in the bottom row is the sum of the two numbers above it.

7. When a number is multiplied by 10, the digits move **left** one place-value column.

When a number is multiplied by 100, the digits move **left** two place-value columns.

8. a.

	$\times 10$	$\times 100$
90	900	9000
7	70	700
97	970	9700

b. To find each number in a shaded square, you had to **divide** one of the other numbers by 10 or 100.

c. When you divide by 10 or 100, the digits move **right** one or two places.

9. a.

	$\times 10$	$\times 100$
40	400	4000
2	20	200
42	420	4200

b.

	$\times 10$	$\times 100$
60	600	6000
8	80	800
68	680	6800

c.

	$\times 10$	$\times 100$
30	300	3000
9	90	900
39	390	3900

10. You may have called your strategy the Take Off Zeros strategy or something similar.

Your rules should be similar to the following:

- To divide a number by 10, take off **one** zero.
- To divide a number by 100, take off **two** zeros.

Day 13: Division in Three Steps

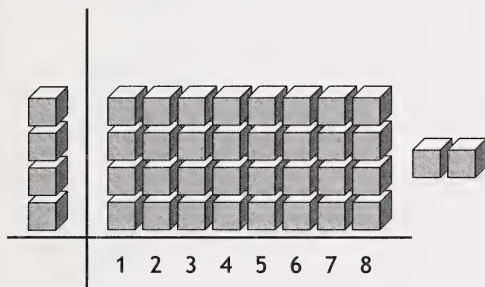
1. a. No.

b. There are only 3 tens, but there are four rows. One row will have no ten.

2. a. 30 ones cubes

b. 34 ones

c.



3. a. No.

b. 8 cubes

c. 32 cubes

d. 2 cubes

4. a. $8 \times 3 = 24$ or $3 \times 8 = 24$

b.

$$\begin{array}{r} 3 \\ 8 \overline{) 27} \end{array}$$

5. a. $8 \times 3 = 24$

b.

$$\begin{array}{r} 3 \\ 8 \overline{) 27} \\ - 24 \\ \hline \end{array}$$

6. a. $27 - 24 = 3$

b.

$$\begin{array}{r} 3 \\ 8 \overline{) 27} \\ \underline{- 24} \\ 3 \end{array}$$

7. a. The remainder is 3.

b. $27 \div 8 = 3 \text{ R}3$

c.

ANSWER TO THE PROBLEM

They could make 3 teams of 8. There would be 3 students left over.

8.

$$\begin{array}{r} 8 \\ 5 \overline{) 42} \\ \underline{- 40} \\ 2 \end{array}$$

← Step 1: Estimate

← Step 2: Multiply

← Step 3: Subtract

$42 \div 5 = 8 \text{ R}2$

9.

$$\begin{array}{r} 7 \overline{) 52} \\ \underline{-49} \\ 3 \end{array}$$

$$52 \div 7 = 7 \text{ R}3$$

10.

$$\begin{array}{r} 6 \overline{) 39} \\ \underline{-36} \\ 3 \end{array}$$

$$39 \div 6 = 6 \text{ R}3$$

11.

$$\begin{array}{r} 6 \overline{) 62} \\ \underline{-54} \\ 8 \end{array}$$

$$62 \div 9 = 6 \text{ R}8$$

12.

$$\begin{array}{r} 6 \overline{) 50} \\ \underline{-48} \\ 2 \end{array}$$

$$50 \div 8 = 6 \text{ R}2$$

13. a. $0 \div 9 = 0$ b. $0 \div 14 = 0$
 c. $0 \div 26 = 0$ d. $0 \div 59 = 0$
 e. $0 \div 167 = 0$ f. $0 \div 632 = 0$

14. Your answers must follow the pattern shown here:

$$(\text{Any number except } 0) \div 0 = \square$$



You must show zero as the divisor.

For example: $16 \div 0 = \square$

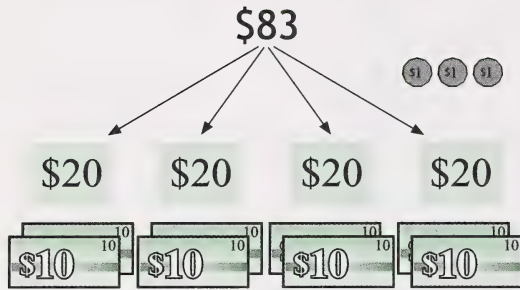
$$35 \div 0 = \square$$

$$64 \div 0 = \square$$

$$99 \div 0 = \square$$

Day 14: Dividing Money Amounts

1.



Each person receives about \$20.

2. a. $3 \overline{) \frac{20}{60}}$

b. $2 \overline{) \frac{40}{80}}$

c. $6 \overline{) \frac{10}{60}}$

d. $2 \overline{) \frac{20}{44}}$

e. $5 \overline{) \frac{10}{56}}$

f. $3 \overline{) \frac{20}{71}}$

g. $4 \overline{) \frac{20}{84}}$

h. $7 \overline{) \frac{10}{74}}$

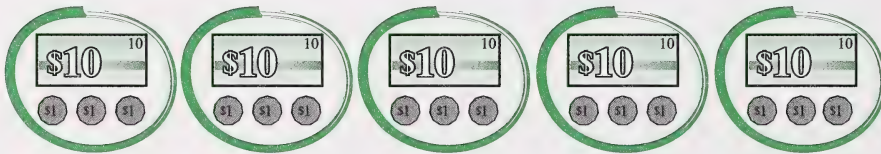
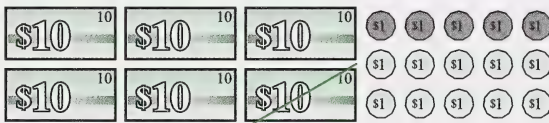
i. $3 \overline{) \frac{30}{95}}$

j. $2 \overline{) \frac{40}{83}}$

k. $6 \overline{) \frac{10}{76}}$

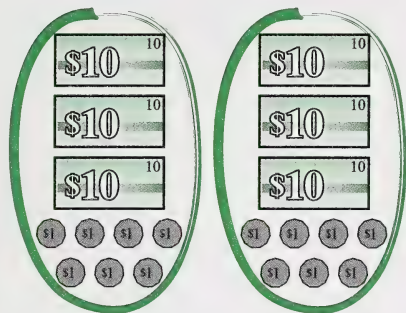
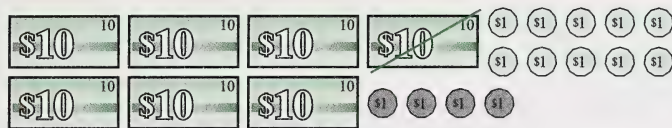
l. $3 \overline{) \frac{20}{77}}$

3. a. \$65 shared by 5 people



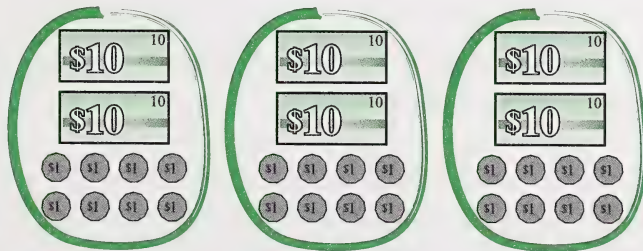
Each share is \$13.

b. \$74 shared by 2 people



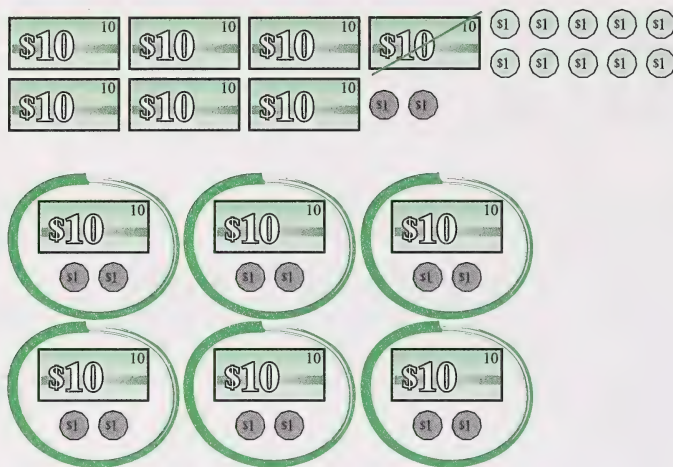
Each share is **\$37**.

c. \$84 shared by 3 people



Each share is **\$28**.

- d. \$72 shared by 6 people



Each share is \$12.

4. a.

Seconds	1	2	3	4	5	6	7	8	9	10
Number of Cells	2	4	8	16	32	64	128	256	512	1024

b.

ANSWER TO THE PROBLEM

There will be 1024 cells after 10 seconds have passed.

- c. You should explain that your solution tells the number of cells after 10 seconds, which is what the question in the problem is asking.
- d. You should explain that your answer seems reasonable and give a reason why. For example, if your answer was 1024 cells, you could say your answer seems reasonable because the number of cells doubles each second.

- e. Other answers are possible. Another method you might try is using a T-table instead of a horizontal table.

5. a., b., c.

Said When Counting by 5s	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195
Divides Evenly by 4				140				160				180			
Divides Evenly by 8								160							

d.

ANSWER TO THE PROBLEM

The number is **160**.

- e. You should explain that your solution gives one number that meets certain rules. This is what the problem was asking you to find.
- f. You should explain that your answer seems reasonable and give a reason why. You might say that your answer seems reasonable because it meets all of the rules.

Day 15: Division in Four Steps

1. a.

$$\begin{array}{r} 12 \\ 8 \overline{) 97} \\ \underline{- 8} \\ 17 \\ \underline{- 16} \\ 1 \end{array}$$

b. $97 \div 8 = 12 \text{ R}1$

2. a.

$$\begin{array}{r} 16 \\ 3 \overline{) 48} \\ \underline{- 3} \\ 18 \\ \underline{- 18} \\ 0 \end{array}$$

$48 \div 3 = 16$

b.

$$\begin{array}{r} 15 \\ 5 \overline{) 75} \\ \underline{- 5} \\ 25 \\ \underline{- 25} \\ 0 \end{array}$$

$75 \div 5 = 15$

c.

$$\begin{array}{r}
 14 \\
 4 \overline{) 57} \\
 \underline{- 4} \\
 17 \\
 \underline{- 16} \\
 1
 \end{array}$$

$$57 \div 4 = 14 \text{ R}1$$

d.

$$\begin{array}{r}
 17 \\
 3 \overline{) 53} \\
 \underline{- 3} \\
 23 \\
 \underline{- 21} \\
 2
 \end{array}$$

$$53 \div 3 = 17 \text{ R}2$$

e.

$$\begin{array}{r}
 29 \\
 3 \overline{) 87} \\
 \underline{- 6} \\
 27 \\
 \underline{- 27} \\
 0
 \end{array}$$

$$87 \div 3 = 29$$

f.

$$\begin{array}{r}
 24 \\
 4 \overline{) 96} \\
 \underline{- 8} \\
 16 \\
 \underline{- 16} \\
 0
 \end{array}$$

$$96 \div 4 = 24$$

3. a. $27 \div 2 =$

$$\begin{array}{r} 13 \\ 2 \overline{)27} \\ - 2 \\ \hline 07 \\ - 6 \\ \hline 1 \end{array}$$

$27 \div 2 = 13 \text{ R}1$

Nick can make 13 pairs of socks.

b. $88 \div 7 =$

$$\begin{array}{r} 12 \\ 7 \overline{)88} \\ - 7 \\ \hline 18 \\ - 14 \\ \hline 4 \end{array}$$

$88 \div 7 = 12 \text{ R}4$

Dirk can buy 12 kits for \$88.

c. $72 \div 5 =$

$$\begin{array}{r} 14 \\ 5 \overline{)72} \\ - 5 \\ \hline 22 \\ - 20 \\ \hline 2 \end{array}$$

$72 \div 5 = 14 \text{ R}2$

Fourteen teams of 5 can be made.

d. $90 \div 6 =$

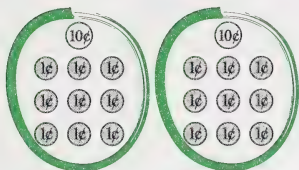
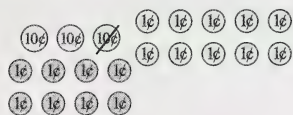
$$\begin{array}{r} 15 \\ 6 \overline{)90} \\ - 6 \\ \hline 30 \\ - 30 \\ \hline 0 \end{array}$$

$90 \div 6 = 15$

Sally put 15 candies in each treat bag.

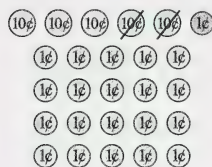
Taking Another Look

4. a. 38¢ shared by 2 people



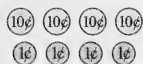
Each person will receive 19¢.

b. 51¢ shared by 3 people



Each person will receive 17¢.

c. 44¢ shared by 4 people



Each person will receive 11¢.

d. 60¢ shared by 5 people



Each person will receive 12¢.

5. a.
$$\begin{array}{r} 14 \\ 3 \overline{)42} \\ - 3 \\ \hline 12 \\ - 12 \\ \hline 0 \end{array}$$

b.
$$\begin{array}{r} 17 \\ 4 \overline{)68} \\ - 4 \\ \hline 28 \\ - 28 \\ \hline 0 \end{array}$$

c.
$$\begin{array}{r} 35 \\ 2 \overline{)70} \\ - 6 \\ \hline 10 \\ - 10 \\ \hline 0 \end{array}$$

d.
$$\begin{array}{r} 15 \\ 5 \overline{)75} \\ - 5 \\ \hline 25 \\ - 25 \\ \hline 0 \end{array}$$

Day 16: More Ways to Check Quotients

1. a. 1 b. 1
 c. 28 d. 1
 e. 0 f. 52
 g. 1 h. 0
 i. 1 j. 99

2. a.
$$\begin{array}{r} 4 \overline{)23} \\ - 20 \\ \hline 3 \end{array}$$

$23 \div 4 = 5 \text{ R}3$

Calculator answer: **5.75**

b.
$$\begin{array}{r} 6 \overline{)36} \\ - 36 \\ \hline 0 \end{array}$$

$36 \div 6 = 6$

Calculator answer: **6**

c.
$$\begin{array}{r} 5 \overline{)72} \\ - 5 \\ \hline 22 \\ - 20 \\ \hline 2 \end{array}$$

$72 \div 5 = 14 \text{ R}2$

Calculator answer: **14.4**

d.
$$\begin{array}{r} 8 \overline{)43} \\ - 40 \\ \hline 3 \end{array}$$

$43 \div 8 = 5 \text{ R}3$

Calculator answer: **5.375**

e. $500 \div 10 = 50$

Calculator answer: **50**

f. $8000 \div 100 = 80$

Calculator answer: **80**

3.

These Questions Should Be Done in My Head	These Questions Should Be Done with Pencil and Paper or with a Calculator
$15 \div 15 =$	$52 \div 7 =$
$760 \div 10 =$	$35 \div 3 =$
$24 \div 1 =$	$97 \div 5 =$
$0 \div 64 =$	$68 \div 9 =$
$3100 \div 100 =$	

4. a. To find the number of full cartons each boy had, divide the number of bottles by 6.

Sam

$$\begin{array}{r}
 13 \text{ R}1 \\
 6 \overline{)79} \\
 \underline{- 6} \\
 19 \\
 \underline{- 18} \\
 1
 \end{array}$$

Sam had 13 full cartons.

Neil

$$\begin{array}{r}
 8 \text{ R}3 \\
 6 \overline{)51} \\
 \underline{- 48} \\
 3
 \end{array}$$

Neil had 8 full cartons.

Dan

$$\begin{array}{r}
 10 \text{ R}2 \\
 6 \overline{)62} \\
 \underline{- 6} \\
 02 \\
 \underline{- 0} \\
 2
 \end{array}$$

Dan had 10 full cartons.

b. Yes, there are enough leftover bottles to fill one more carton. Sam has one leftover bottle, Neil has three, and Dan has two.

$$1 + 3 + 2 = 6 \text{ bottles}$$

The six leftover bottles will fill one more carton.

5. Division Number Facts

9	5	4	9	7
8	7	3	5	6
9	3	4	4	2
6	8	8	3	6
3	5	6	9	4

6. Multiplication Number Facts

18	36	45	12	24
27	24	64	45	40
30	36	35	63	30
18	25	49	15	32
63	48	81	16	54

Day 17: Putting It All Together (II)

Complete your Day 17 activities in Assignment Booklet 6B and send them in for marking by your teacher.

Day 18: Assessing What You Know

Complete your Day 18 activities in Assignment Booklet 6B and send them in for marking by your teacher.

Image Credits

Some clip art drawings are commercially owned.

Introductory Pages

Basic Number Facts: EyeWire, Inc.

Computers: PhotoDisc, Inc. 2000

Journal Writing: PhotoDisc, Inc. 2000

Page

1 PhotoDisc, Inc. 2000
3 PhotoDisc, Inc. 2000
4 EyeWire, Inc.
7 Corel Corporation
9 EyeWire, Inc.
11 © 2000 www.arttoday.com
14 PhotoDisc, Inc. 2000
15 © 2000 www.arttoday.com
21 © 2000 www.arttoday.com
44 EyeWire, Inc.
50 PhotoDisc, Inc. 2000
53 © 2000 www.arttoday.com
54 PhotoDisc, Inc. 2000
60 EyeWire, Inc.
69 RubberBall Productions/EyeWire, Inc.

71 © 2000 www.arttoday.com
75 PhotoDisc, Inc. 2000
78 © 2000 www.arttoday.com
82 © 2000 www.arttoday.com
85 © 2000 www.arttoday.com
88 © 2000 www.arttoday.com
89 RubberBall Productions/EyeWire, Inc.
90 PhotoDisc, Inc. 2000
91 © 2000 www.arttoday.com
92 © 2000 www.arttoday.com
98 © 2000 www.arttoday.com
105 © 2000 www.arttoday.com
106 © 2000 www.arttoday.com
107 © 2000 www.arttoday.com
108 © 2000 www.arttoday.com
109 © 2000 www.arttoday.com
115 © 2000 www.arttoday.com
118 © 2000 www.arttoday.com
119 © 2000 www.arttoday.com
142 © 2000 www.arttoday.com
157 © 2000 www.arttoday.com
166 EyeWire, Inc.

Cut-Out Learning Aids

Day 3: Division Cards

$12 \div 2 =$

$12 \div 3 =$

$12 \div 4 =$

$12 \div 6 =$

$14 \div 2 =$

$14 \div 7 =$

$15 \div 3 =$

$15 \div 5 =$

$16 \div 2 =$

$16 \div 4 =$

$16 \div 8 =$

$4 \div 2 =$

$18 \div 3 =$

$18 \div 2 =$

$18 \div 9 =$

$18 \div 6 =$

Answer: 4

Answer: 6

Answer: 2

Answer: 3

Answer: 2

Answer: 7

Answer: 3

Answer: 5

Answer: 4

Answer: 8

Answer: 2

Answer: 2

Answer: 9

Answer: 6

Answer: 3

Answer: 2

Day 3: Division Cards

$54 \div 6 =$

$56 \div 8 =$

$56 \div 7 =$

$63 \div 9 =$

$63 \div 7 =$

$64 \div 8 =$

$72 \div 8 =$

$72 \div 9 =$

$81 \div 9 =$

$10 \div 2 =$

$10 \div 5 =$

$9 \div 3 =$

$8 \div 4 =$

$8 \div 2 =$

$6 \div 3 =$

$6 \div 2 =$

Answer: 7

Answer: 9

Answer: 7

Answer: 8

Answer: 8

Answer: 9

Answer: 8

Answer: 9

Answer: 5

Answer: 9

Answer: 3

Answer: 2

Answer: 4

Answer: 2

Answer: 3

Answer: 2

Day 3: Division Cards

$32 \div 8 =$

$35 \div 7 =$

$35 \div 5 =$

$36 \div 4 =$

$36 \div 9 =$

$36 \div 6 =$

$40 \div 5 =$

$40 \div 8 =$

$42 \div 6 =$

$42 \div 7 =$

$45 \div 5 =$

$45 \div 9 =$

$48 \div 6 =$

$48 \div 8 =$

$49 \div 7 =$

$54 \div 9 =$

Answer: 5

Answer: 4

Answer: 9

Answer: 7

Answer: 6

Answer: 4

Answer: 5

Answer: 8

Answer: 6

Answer: 7

Answer: 5

Answer: 9

Answer: 6

Answer: 8

Answer: 6

Answer: 7

Day 3: Division Cards

$20 \div 4 =$

$20 \div 5 =$

$21 \div 3 =$

$21 \div 7 =$

$24 \div 3 =$

$24 \div 8 =$

$24 \div 4 =$

$24 \div 6 =$

$25 \div 5 =$

$27 \div 3 =$

$27 \div 9 =$

$28 \div 4 =$

$28 \div 7 =$

$30 \div 6 =$

$30 \div 5 =$

$32 \div 4 =$

Answer: 4

Answer: 5

Answer: 3

Answer: 7

Answer: 3

Answer: 8

Answer: 4

Answer: 6

Answer: 9

Answer: 5

Answer: 7

Answer: 3

Answer: 5

Answer: 4

Answer: 8

Answer: 6

Day 4: Multiplication Table

Multiplication Table

x	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

Day 5: Hundred Counting Chart

One Hundred Counting Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Day 10: \times / \div Mat

(Cut on this strip.)

↑ (Glue or tape second page here) ↑

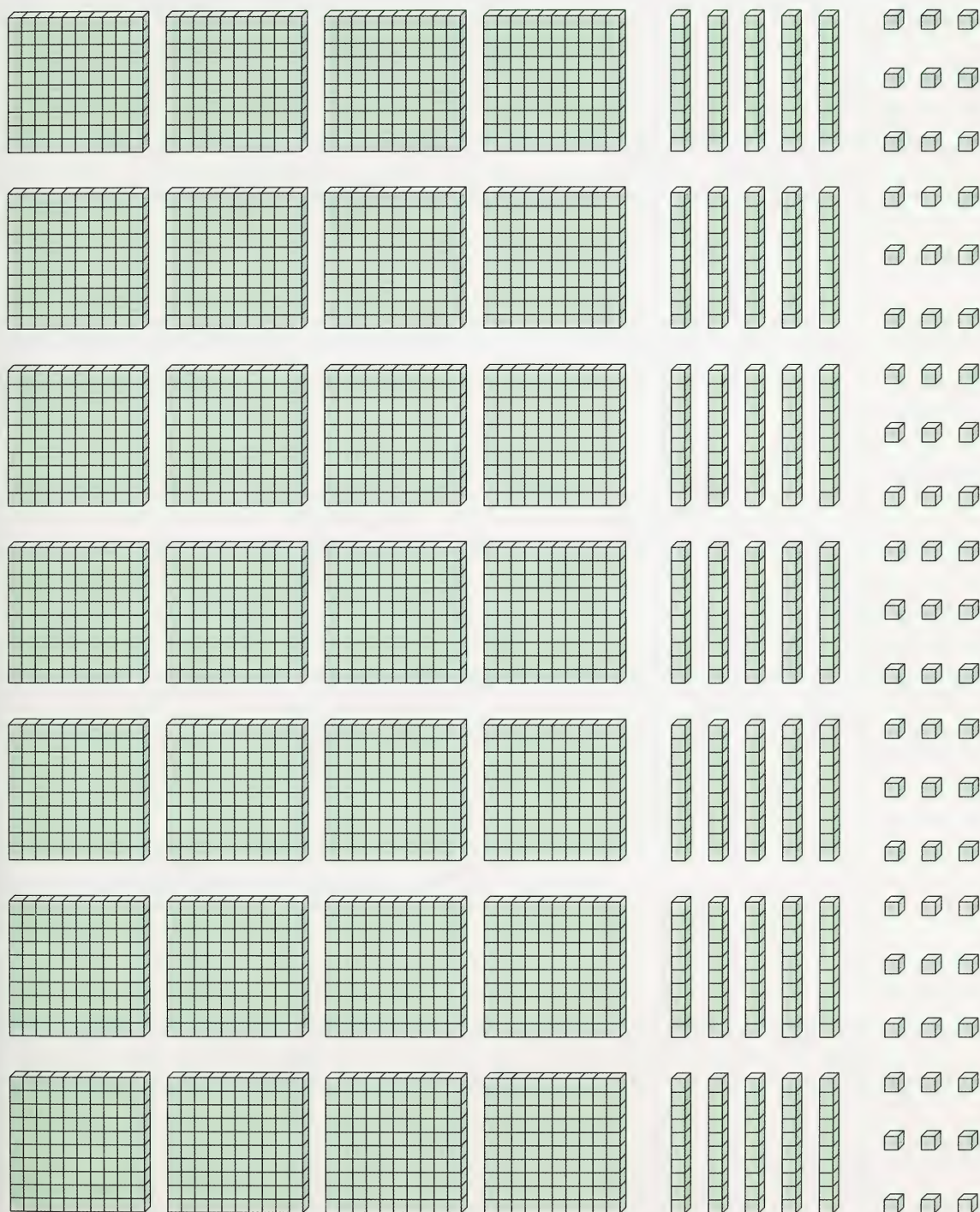
BASE 1

Day 10: \times / \div Mat (continued)

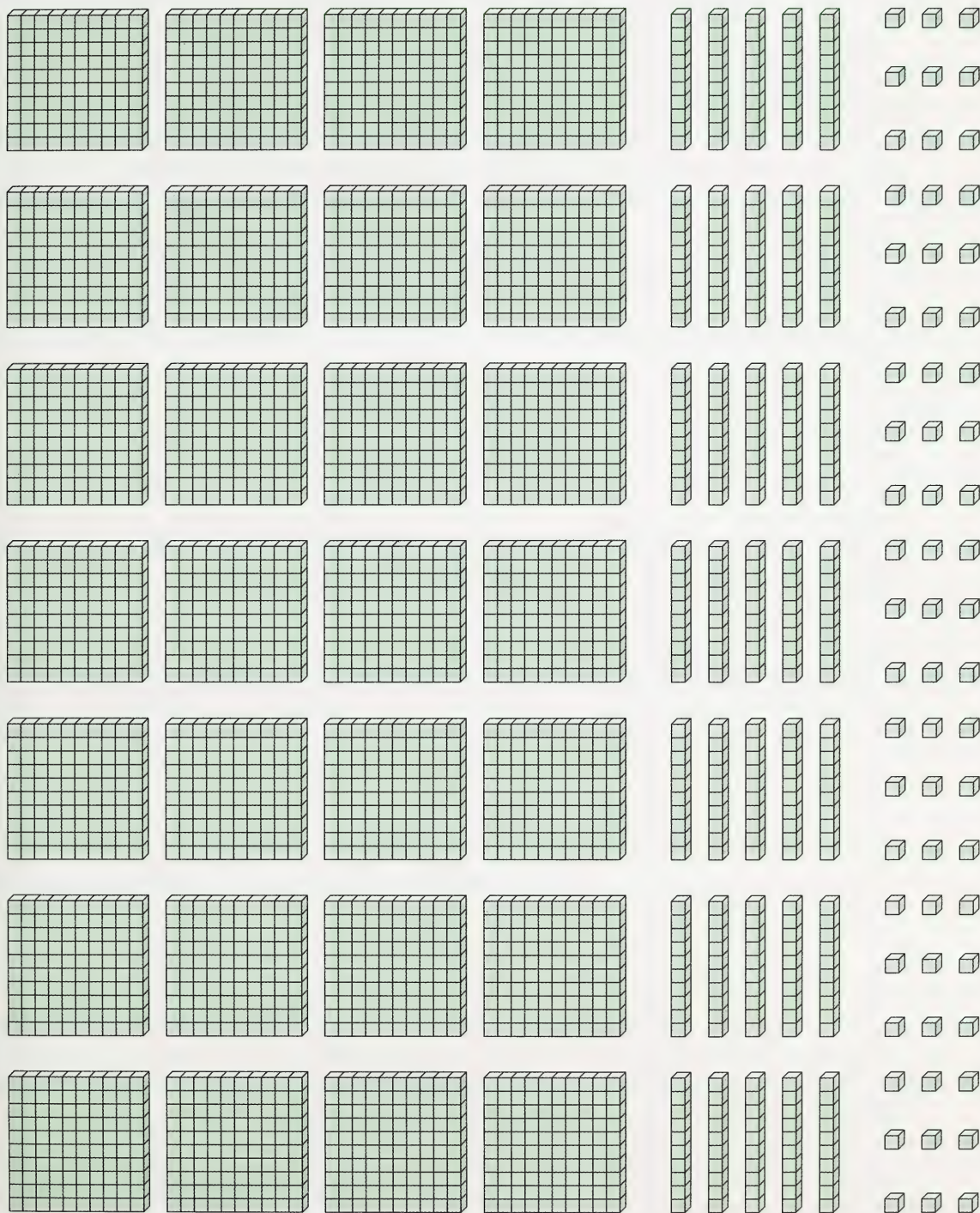
(Cut on this strip.)

TEN MAT: $\boxed{\times}$ $\boxed{\div}$

Day 10: Cut-Out Base Ten Blocks



Day 10: Cut-Out Base Ten Blocks



Number Facts Progress Chart for Module 6

Your Score

25										
20										
15										
10										
5										



Day 3



Day 3



Day 6



Day 6



Day 11



Day 11



Day 16



Day 16





LRDC

Mathematics 4
Student Module Booklet
Module 6

2000